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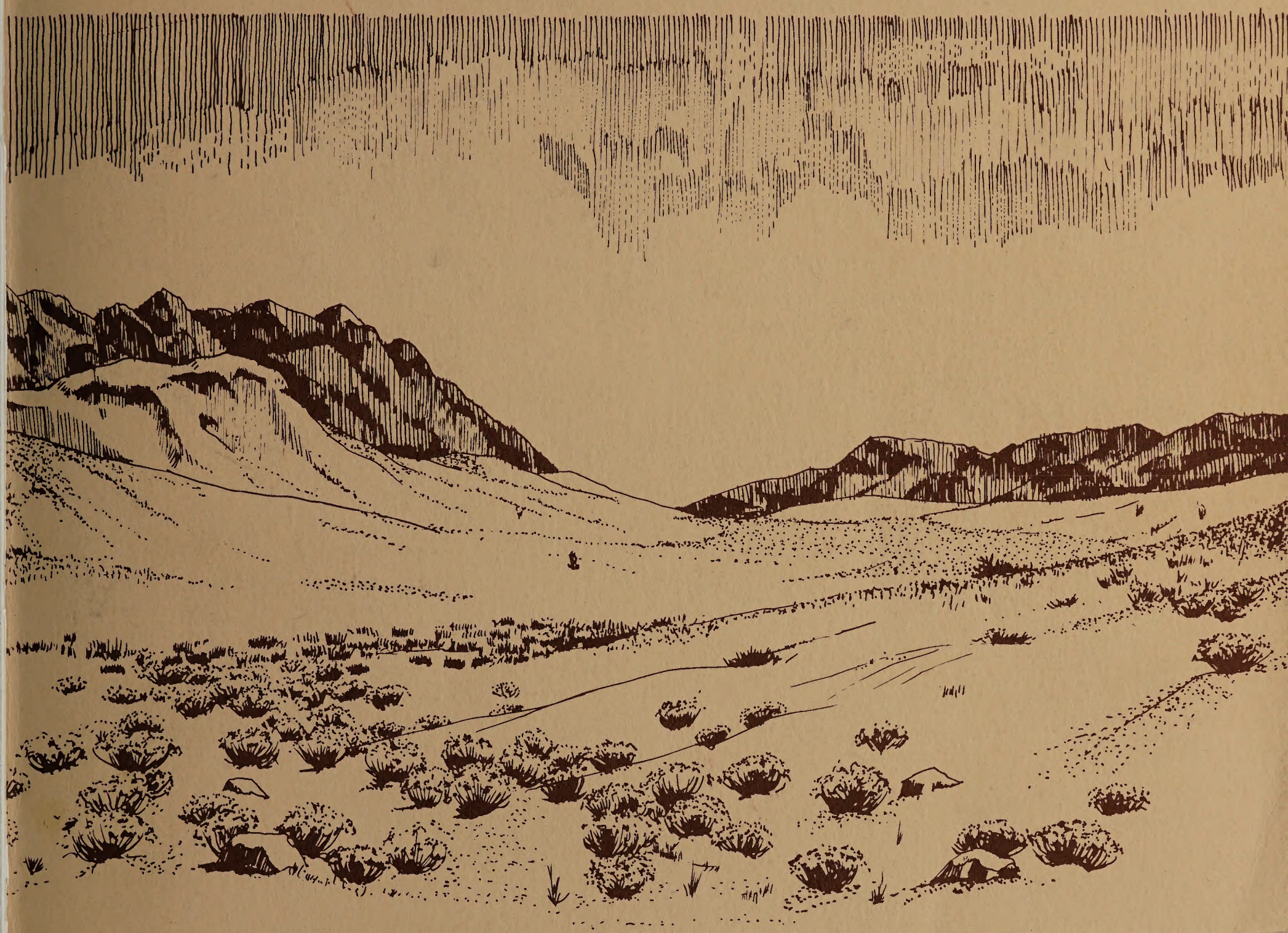

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SOIL INVENTORY OF TONOPAH RANGE ENVIRONMENTAL IMPACT STATEMENT AREA

SELECTED AREAS WITHIN NYE COUNTY, NEVADA

INVENTORY AND REPORT

BY

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JUNE, 1977

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SOIL INVENTORY OF TONOPAH RANGE
ENVIRONMENTAL IMPACT STATEMENT AREA
Selected Areas in Nye County, Nevada

INTRODUCTION

The Tonopah Range Soil Inventory was done primarily to provide soils data as an input for an Environmental Impact Statement (EIS) to be prepared by the U.S. Department of Interior, Bureau of Land Management. To the extent possible, the soil inventory contained herein was conducted in accordance with the standards of the National Cooperative Soil Survey, as developed by the USDA, Soil Conservation Service. Thus, the inventory provides soils data in a standard format that are valuable to a wide variety of users in making wise land use and management decisions.

BACKGROUND

Location

Components of the Tonopah Range Soil Inventory are located in Nye County in Central Nevada (FIGURE 1). The inventory area consists of nine discrete areas totaling 296,386 acres. Two are in Hot Creek Valley, with 71,417 acres; two are in Stone Cabin Valley, with 61,723 acres; two are in Little Fish Lake Valley, with 54,875 acres; two are in Monitor Valley, with 66,295 acres; and one is in Ione Valley, with 42,076 acres.

Vegetation

All nine areas are primarily rangeland with vegetation consisting of desert or semidesert shrubs, with only small amounts of grass and forbs. Shadscale (Atriplex confertifolia), and greasewood (Sarcobatus vermiculatus) are the most abundant shrub species on the dryer areas. Big sagebrush (Artemisia tridentata), low sagebrush (Artemisia arbuscula), and black sagebrush (Artemisia nova), are the principal shrubs in moister areas. Bottomlands

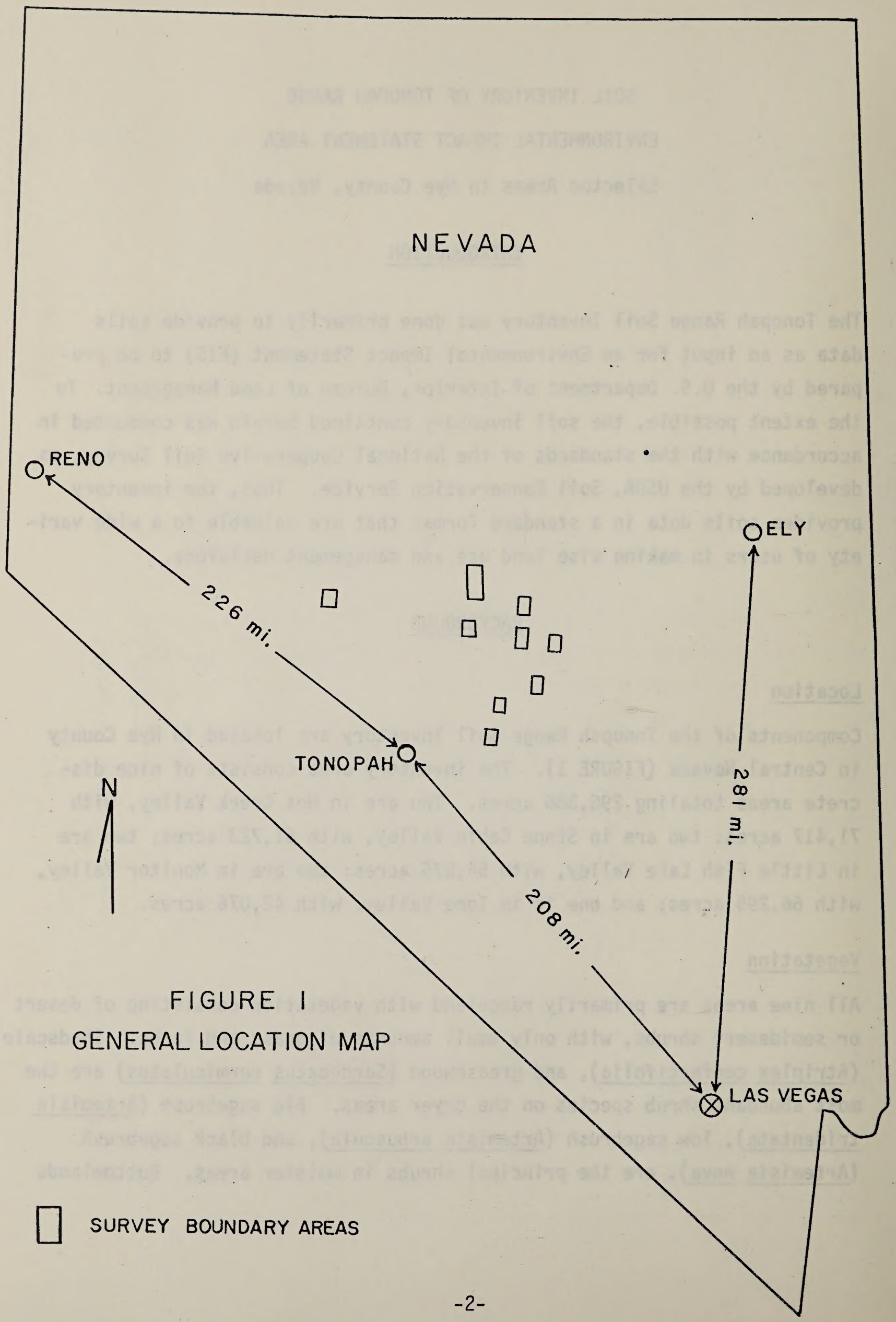


FIGURE I
GENERAL LOCATION MAP

have big sagebrush, greasewood, and rubber rabbitbrush (Chrysothamnus nauseosus). Areas with high water tables have sedges (Carex spp.) and saltgrass (Distichlis stricta). Where the components extend into mountainous areas, pinyon pine (Pinus monophylla) and juniper (Juniperus utahensis spp.) are common trees. Indian ricegrass (Oryzopsis hymenoides) is indigenous to most areas, with some galleta (Hilaria jamesii) at lower elevations. Minor amounts of blue grama (Bouteloua gracilis) occurs in the higher elevations (e.g. Monitor Valley). Other common shrubs occurring in lesser amounts are bud sagebrush (Artemisia spinescens), spiny hopsage (Grayia spinosa), and narrow leaf horsebrush (Tetradymi spp.). Low rabbitbrush (Chrysothamnus spp.) is a common invader in nearly all areas inventoried.

Physiography and Geology

The entire inventory area is situated in the Basin and Range Province (Thornbury, 1965) in the Great Basin Section, between 5,500 and 7,800 feet elevation. This province consists of numerous, short, block-faulted mountain ranges and intermontane aggradational plains in about equal proportions. Most of the Great Basin Section has internal drainage.

The nine components of this inventory occur mainly in the intermontane areas with only small areas along the inventory boundaries extending into the mountains.

Mountainous areas make up about 15 percent of the inventory area. The mountainous areas have a rather complex geology and consist of a wide range of igneous and sedimentary rock. Notwithstanding the geologic complexity, light colored rhyolitic tuffs and dark colored ignembrites are common rock features.

The intermontane areas, making up about 85 percent of the inventoried acres, consist of coarse-textured valley-filling sediments. Strongly cemented silica pans (duripans) are a common feature on most of the bajadas. These silica pans usually occur near the surface at depths of 10 to 30 inches and are a few inches to a few feet thick. They are usually underlain by thick strata of sand, gravel and cobble.

Climate

The Tonopah Range area experiences a desertic climate that borders on a Mediterranean climatic regime. The precipitation is sparse and is largely dependent on elevation. About 6 inches of precipitation are received annually at the lower elevations and up to about 12 inches are received in the higher elevations. About 85 percent of the inventory area receives less than 10 inches. About half the annual precipitation occurs as winter snow. The other half occurs mainly in summer thunderstorms. Late spring-early summer and late fall-early winter are the dryest periods of the year (Schaeffer, 1969).

SOIL INVENTORY

The soil inventory of third order intensity, (USDA-SCS, 1975B) was made by soil scientists who drove or walked over the land, digging holes, examining soil, describing soil profiles, and taking notes on pertinent soil and landscape characteristics. Soils with similar characteristics were grouped together and dissimilar soils were separated.

For the purposes of this inventory, groups of contiguous, similar soils were classified at the series level as defined in the USDA soil classification system, Soil Taxonomy (USDA-SCS, 1975A). These series are groups of soils having horizons similar in differentiating characteristics and arrangement in the soil profile, except for texture of the surface part. The series were used in designing mapping units which were located and delineated on aerial photographs at a scale of about 1:31,680, except for Ione which was about 1:63,360. The minimum size of mapping unit delineation is about 10 acres. A cursory field correlation was conducted by E. A. Naphan, State Soil Scientist, USDA, Soil Conservation Service, Reno, Nevada. Subsequently, most of the soils are tentatively named. Two are taxadjuncts and two are unnamed. All soil names are tentative, pending final correlation.

The mapping units are composed of phases of the series and or miscellaneous areas. A phase is a subdivision of series having characteristics that affect the use and management of the soil, but which do not vary sufficiently to differentiate it as a separate series. Miscellaneous areas are kinds of land having excessive rock outcrop, excessive stones, or very steep eroded slopes. Mapping units, consisting of consociations, associations, complexes and miscellaneous areas (USDA-SCS, 1975B), were delineated in this inventory. Consociations are mapping units in which only one identified phase or miscellaneous area, plus allowable inclusions, occurs in each delineation. A soil association consists of areas of different kinds of soil occurring in a definite geographical relation to one another, but because of the map scale being used it is impractical to separate them. A soil complex is a geographic mixture of areas of different kinds of soils, or of soil and miscellaneous areas that are associated in a pattern so intricate that it is impractical to separate them at the map scale being used.

IDENTIFICATION LEGEND

All mapping units developed for this soil inventory have been assigned a mapping unit designation (TABLE 1). This designation consists of a four digit number and one or more letters. Numbers refer to a specific series, whereas, letters indicate slope ranges or certain surface soil characteristics. These letter designations indicate the following:

a. 0 to 3 percent slope range

b. 3 to 8 percent slope range

c. 8 to 15 percent slope range

d. 15 to 30 percent slope range

e. 30 to 60 percent slope range

S stony or cobbly surface (15-35% coarse fragments)

SS very stony and/or cobbly surface (35-85% coarse fragments)

These connotative symbols appear on the detailed soil maps and identify the mapping units as shown in the Identification Legend as (TABLE 1).

TABLE 1

IDENTIFICATION LEGEND

Map Symbol	Map Unit Names
3834a	Fang sandy loam, 0 to 3 percent slopes
3834asi	Fang silt loam, gullied, 0 to 3 percent slopes
3834ax	Fang fine sandy loam, slightly saline-alkali, eroded, 0 to 3 percent slopes
3834b	Fang sandy loam, 3 to 8 percent slopes
3834sa	Fang fine sandy loam, strongly saline-alkali, eroded, 0 to 3 percent slopes
3835a	Deerlodge gravelly sandy loam, 0 to 3 percent slopes
3835b	Deerlodge gravelly sandy loam, 3 to 8 percent slopes
3835-3834b	Deerlodge-Fang association, 3 to 8 percent slopes
3835-3851a	Deerlodge-Dun Glen complex, 0 to 3 percent slopes
3835-3851b	Deerlodge-Dun Glen association, 3 to 8 percent slopes
3835-3854-3834b	Deerlodge-Indian Creek-Fang association, 3 to 8 percent slopes
3837b	Cliffdown gravelly sandy loam, 3 to 8 percent slopes
3838a	Saltair silt loam, strongly saline, 0 to 3 percent slopes
3839a	Puddle fine sandy loam, 0 to 3 percent slopes
3839b	Puddle gravelly sandy loam, 3 to 8 percent slopes
3840de	Rock Outcrop, Lithic, Xeric Torriorthents and Lithic Xerollic Haplargids, 15 to 60 percent slopes
3841deSS	Xeric Torriorthents, 15 to 60 percent slopes
3842bSS	Xeric Torriorthents and Xerollic Camborthids, 3 to 8 percent slopes
3842cSS	Xeric Torriorthents and Xerollic Camborthids, 8 to 15 percent slopes
3842dSS	Xeric Torriorthents and Xerollic Camborthids, 15 to 30 percent slopes
3850cS	Ursine cobbly loamy sand, 8 to 15 percent slopes
3850dSS	Ursine very stony loamy sand, 15 to 30 percent slopes
3850-3851b	Ursine-Dun Glen association, 3 to 8 percent slopes
3851a	Dun Glen sandy loam, 0 to 3 percent slopes
3851b	Dun Glen sandy loam, 3 to 8 percent slopes
3851-3851a1	Dun Glen association, 0 to 3 percent slopes
3852b	Spanel gravelly sandy loam, 3 to 8 percent slopes
3852bS	Spanel stony sandy loam, 3 to 8 percent slopes
3853a	Alcorn loamy sand, 0 to 3 percent slopes
3853b	Alcorn loamy sand, 3 to 8 percent slopes
3854b	Indian Creek gravelly loamy sand, 3 to 8 percent slopes
3854bcSS	Indian Creek very cobbly sandy loam, 3 to 15 percent slopes
3854-3853b	Indian Creek-Alcorn association, 3 to 8 percent slopes
3856a	Olson gravelly sandy loam, 0 to 3 percent slopes
3856aS	Olson cobbly sandy loam, 0 to 3 percent slopes
3856b	Olson gravelly sandy loam, 3 to 8 percent slopes
3856bS	Olson cobbly sandy loam, 3 to 8 percent slopes
3856cdS	Olson cobbly sandy loam, 8 to 30 percent slopes
3856-3858a	Olson-Haploxerollic Durorthid complex, 0 to 3 percent slopes

TABLE 1

IDENTIFICATION LEGEND (Cont'd)

Map Symbol	Map Unit Names
3856-3858b	Olson Haploxerollic Durorthid complex, 3 to 8 percent slopes
3856-3861bS	Olson Xerollic Haplargid complex, 3 to 8 percent slopes
3857a	Ratto gravelly sandy loam, 0 to 3 percent slopes
3857bS	Ratto stony gravelly sandy loam, 3 to 8 percent slopes
3858a	Haploxerollic Durorthid, gravelly sandy loam, 0 to 3 percent slopes
3858-3859a	Haploxerollic Durorthid-Shipley association, 0 to 3 percent slopes
3858-3859-3860a	Haploxerollic Durorthid-Shipley-Bereniston association, saline-alkali, 0 to 3 percent slopes
3859a	Shipley gravelly sandy loam, 0 to 3 percent slopes
3859-3860a	Shipley-Bereniston complex, saline-alkali, 0 to 3 percent slopes
3860a	Bereniston silt loam, 0 to 3 percent slopes
38613856a	Xerollic Haplargid-Olson complex, 0 to 3 percent slopes
3862a	Hutton silty clay loam, 0 to 3 percent slopes
3862ax	Hutton silty clay loam, saline-alkali, eroded, 0 to 3 percent slopes

SERIES AND MAPPING UNIT DESCRIPTIONS

The salient features of each series and mapping unit are presented in this section. The series are described in general terms and are followed by mapping unit descriptions of the respective series. Mapping units are discussed in terms of their similarities and differences from the series description and from one another.

More specific and technical soil series descriptions are presented in Appendix A of this report. These are in alphabetical order.

These soil series represent the soil as it occurs in the inventory area. The profile description is typical of the series as it occurs in the inventory area, and is not the pedon of the established series. The Type Location is the location of the series as it is represented in the inventory area and is not the Type Location for the established series.

(3834) Fang Series

The Fang series is a member of the coarse-loamy, mixed (calcareous), mesic family of Typic Torriorthents. The series consists of deep, brown, moderately coarse-textured soils. They are well-drained and are derived from reworked old valley-fill material that has a high content of silt and sand. They occur on landscapes that are nearly level to moderately sloping bottomlands.

Profile Description: Fang loamy fine sand

Surface layer:	0-4"	Very pale brown loamy fine sand, soft to loose, strongly alkaline. (2 to 6 inches thick.)
Subsurface:	4-26"	Light gray loamy fine sand, soft, strongly alkaline. (10 to 30 inches thick.)
Substratum:	26-60"	Very pale brown sandy loam, soft, strongly alkaline. (10 to 30 inches thick.)

Variations: In places, the surface may have up to 30 or 40 percent gravel. The textures of the soil profile are somewhat variable and exhibit stratification. The textures of the upper part of the profile are predominantly loamy sand, sandy loam, or silt loam and may contain varying amounts of gravel. The gravel content normally increases with depth. These soils normally are calcareous throughout, but some pedons are noncalcareous in the surface.

Setting: The Fang soils occur on both broad and narrow bottomlands, in areas between ridges of dissected alluvial fans at elevations between 5,500 and 6,500 feet. Slopes are usually between 1 and 8 percent, but may be steeper in some areas.

The summers are hot and dry and the winters are cool to cold. The mean annual precipitation is 6 to 8 inches. The mean annual air temperature ranges from 45°F. to 51°F. The averages frost-free season is 80 to 110 days.

Geographically Associated Soils: The Fang soils are associated with Saltair, Puddle, Xeric Torriorthents, Dun Glen, and Deerlodge soils. They are differentiated from the Saltair by not having a salic horizon, from the Dun Glen by not having a cambic horizon, and from the Deerlodge soils by not having an argillic horizon.

Soil Behavior: Vegetation consists mainly of big sagebrush, winterfat, and greasewood with scattered ephedra, low rabbitbrush, and galleta. The Fang soils have few physical limitations for brush control and reseeding; however, low moisture availability during the growing season is the principal limiting factor for these practices.

The most serious problem associated with these soils is that they are subject to flooding. Therefore, uses that could be affected adversely by flooding are discouraged.

These soils have poor recreational potential; however, they are well suited for on-site sewage disposal provided they are protected from the flood hazard.

Wildlife habitat for big game species is fair to good and is good for upland game birds.

Mapping Units:

3834a Fang sandy loam, 0 to 3 percent slopes. (5,636 acres). This soil is dominantly deep sandy loam. It occurs on nearly level to gently sloping bottomland areas of major and minor drainageways.

Inclusions of soils with slopes exceeding 3 percent make up less than 15 percent of the mapping unit. Inclusions of Fang soil with a silt loam or loamy fine sand surface horizon may range up to 20 percent.

3834asi Fang silt loam, gullied, 0 to 3 percent slopes. (7,169.1 acres). The soils of this unit are dominantly the Fang silt loam. They occur on nearly level drainage bottoms where the slope is less than 1 percent. This unit usually contains a deep central gully which channels the surface runoff and is rarely flooded.

The inclusions in this mapping unit are other types and phases of the Fang series that make up less than 20 percent of the map unit.

3834ax Fang fine sandy loam, slightly saline-alkali, eroded, 0 to 3 percent slopes. (838.9 acres). Slopes are dominantly 0 to 3 percent. This map unit consists dominantly of Fang fine sandy loam that has been eroded, leaving erosional pedestals up to about 6 inches high, with common rills about one foot deep.

Inclusions are about 20 percent. These include other surface types of Fang soils, and some gravelly sandy washes and gullies that dissect the area.

3834b Fang sandy loam, 3 to 8 percent slopes. (4,964.5 acres). This soil is deep moderately coarse-textured. It occurs on gently to moderately sloping bottomland areas and in drainageways of dissected bajadas and alluvial fans.

Inclusions of soils with greater or lesser slopes and other soils similar to Fang make up less than 15 percent of this map unit.

3834sa Fang fine sandy loam, strongly saline-alkali, eroded, 0 to 3 percent slopes. (2,658.9 acres). Slopes are dominantly 0 to 2 percent. This map unit consists of Fang fine sandy loam

severely eroded, that has vertical erosional pedestals 6 to 24 inches high. Spotty areas of other saline and alkali affected soils occur throughout the map unit.

Inclusions make up about 20 percent of the mapping unit. These are mainly the silt loam and loamy very fine sand surface textures of the Fang series. Also included are areas that are not eroded; small wet areas with high water tables, and gravelly sandy washes and gullies that dissect the map unit.

(3835) Deerlodge Series

The Deerlodge series is a member of the fine-loamy, mixed, mesic family of Xerollic Durargids. The series consists of moderately deep, very pale brown to brown, well-drained upland soils with a duripan at about 25 inches. The soils occur in valley-filling sediments on old alluvial fans and bajadas.

Profile Description: Deerlodge sandy loam

Surface layer:	0-5"	Pale brown to brown sandy loam, slightly sticky, slightly plastic, neutral to mildly alkaline. (2 to 6 inches thick.)
Subsoil:	5-24"	Yellowish brown to dark brown sandy clay loam, sticky and plastic, neutral to moderately alkaline, calcareous in the lower part. (14 to 30 inches thick.)
Substratum:	24-30"	Very pale brown to brown silica and lime cemented duripan, moderately to strongly alkaline. (Several inches to several feet thick.)

Variations: Depth to the duripan ranges from 20 to 40 inches. A thin veneer of gravel may cover 15 to 60 percent of the surface; however, coarse fragments in the surface and upper argillic horizon are usually less than 15 percent by volume. The B2tca horizon usually has 15 to 35 percent gravel and cobble, but may have up to 50 percent. The duripan and substratum are usually very cobbly and gravelly. The A horizon has value of 6 to 7 dry and 4 or 5 moist with chroma of 2 to 4. The B horizons have values of 4 to 6 dry and 4 or 5 moist with chroma of 3 to 6 (typically 4). The surface texture ranges from sandy loam, to loam or sandy clay loam and may or may not be gravelly. The subsoil texture is sandy clay loam and may or may not be gravelly. The upper part of the profile is usually noncalcareous. The lower B2t horizon usually contains visible lime.

Setting: The Deerlodge soils occur on gently sloping to moderately sloping upland fans, in broad basins in Nye County, Nevada, at elevations of 5,500 to 6,500 feet. Slope gradients range from 3 to 8 percent. The soils have formed in old valley-filling sediments on upland fans. The parent materials are from a wide range of sedimentary and igneous rocks.

The climate is arid with cool to cold winters and hot summers. The mean annual precipitation is between 6 and 10 inches. The mean annual air temperature is 45 to 51°F. The frost-free period is 80 to 110 days.

Geographically Associated Soils: The Deerlodge soils are associated with soils of the Dun Glen, Fang, and the Indian Creek series.

Deerlodge soils are distinguished from the Dun Glen and Fang soils by having an argillic horizon. Both the Dun Glen and Fang soils lack a duripan, and the Indian Creek soils are shallow.

Soil Behavior: The vegetation consists of low rabbitbrush, big sagebrush, shadscale, winterfat, and galleta grass. Winterfat is probably the best indicator plant for range condition. Low rainfall is the most limiting factor for successful brush eradication and reseeding practices. These soils should respond slowly to proper range grazing practices. The moderate depth to the duripan is the most limiting factor for most engineering practices.

Recreational development potential is good; however, the surface soil is easily powdered with any kind of traffic, making them dusty and easily eroded.

Wildlife habitat is fair to poor for big game species and is good for upland game birds and small mammals.

Mapping Units:

3835a Deerlodge gravelly sandy loam, 0 to 3 percent slopes. (65.9 acres). Slopes are dominantly 1 to 3 percent. The soils of this unit are dominantly Deerlodge gravelly sandy loam, but include some nongravelly surfaces and loam textured surfaces.

Inclusions are less than 20 percent and include some gravelly washes (which sometimes have stony banks), other surface textures of Deerlodge soils and soils in the Indian Creek and Alcorn series. These inclusions occur at random except for the gravelly washes which occur in the bottom of narrow drainageways that dissect the unit.

3835b Deerlodge gravelly sandy loam, 3 to 8 percent slopes. (15,399.5 acres). Slopes are dominantly 3 to 8 percent. The soils in this unit are dominantly the moderately deep, medium textured Deerlodge series. They occur on alluvial fans.

Inclusions are 15 to 20 percent and include soils in the Dun Glen and Indian Creek series. Also included are narrow, gravelly washes, some stony and/or cobbly unnamed soils on sideslopes adjacent to drainageways and the short steeper slopes at terminal ends of alluvial fans, as well as other surface types of Deerlodge soils.

3835-3834b Deerlodge-Fang association, 3 to 8 percent slopes. (8,426.9 acres). Slopes are dominantly 3 to 8 percent. The soils of this map unit consist of about 50 percent Deerlodge gravelly loamy sand and about 30 percent Fang sandy loam. The Deerlodge soils occur on ridges between drainageways and the Fang soils occur in the bottoms of drainageways.

Inclusions make up about 20 percent of the map unit. The principal inclusion is eroded sideslopes of fans which consist of deep, gravelly and cobbly soils. This inclusion occurs mainly in an intermediate landscape position below the Deerlodge soils and above the Fang soils. Other inclusions are different surface textures of Deerlodge and Fang soils, as well as minor inclusions of other similar soils.

3835-3851a Deerlodge-Dun Glen complex, 0 to 3 percent. (6,718.7 acres) Slopes are dominantly 1 to 3 percent. This map unit consists of about 40 percent Deerlodge gravelly sandy loam and 40 percent Dun Glen gravelly sandy loam. These soils occur on broad fans, with a duripan that is discontinuous. The two principal components occur in no discernible pattern or geographic relation to one another.

Inclusions of other soils make up about 20 percent of the map unit. These include loamy sand surface textures of Deerlodge and Dun Glen, narrow gravelly washes which dissect the area and a soil similar to the Dun Glen except it is slightly coarser textured throughout its deep profile. Other inclusions are Indian Creek and Fang soils.

3835-3851b Deerlodge-Dun Glen association, 3 to 8 percent slopes. (7,217.9 acres). Slopes are dominantly 3 to 5 percent. Deerlodge gravelly sandy loam or loam makes up about 50 percent of this unit and Dun Glen gravelly sandy loam makes up about 30 percent. The Deerlodge soils usually occupy the ridgetops and the Dun Glen soils usually occupy swales.

Inclusions are about 20 percent in this unit and include soils of the Indian Creek series which are shallow to a duripan. Also included are gravelly, sandy washes in the bottoms of drainageways, some stony surfaces near the upper slopes of the unit, and along narrow ridges adjacent to drainageways.

3835-
3854-
3834b

Deerlodge-Indian Creek-Fang association, 3 to 8 percent slopes. (2,171.7 acres). This complex occurs on broad dissected bajadas and fans that slope from areas of Rock Land to lower terraces or bottomlands. Slopes are mainly 3 to 8 percent. This complex is about 35 percent Deerlodge gravelly sandy loam; about 30 percent Indian Creek gravelly loamy sand; and about 20 percent Fang sandy loam. Included in mapping are areas containing other types and phases of Deerlodge, Indian Creek, and Fang soils. Some small areas of Rock Outcrop and Xeric Torriorthents and Xerollic Camborthids are also included.

The Deerlodge soils, which have a duripan at moderate depths, occur on the tops and upper sideslopes of the small ridges within the mapping unit. The Indian Creek soils occur in similar landscape positions, but are shallow to a duripan.

The Fang soils occupy the narrow drainageway bottoms and lower sideslope positions. They do not contain a duripan.

(3837) Cliffdown Series

The Cliffdown series is a member of the loamy-skeletal, mixed (calcareous), mesic family of Typic Torriorthents. The series consists of deep, very pale brown, gravelly and loamy soils. They are well-drained and have formed from valley-filling sediments that have a high content of calcareous gravelly sands and finer materials. They occur on landscapes that are gently sloping to moderately sloping.

Profile Description: Cliffdown gravelly sandy loam

Surface layer: 0-18" Light yellowish brown gravelly sandy loam, loose to very friable, strongly alkaline. (10 to 20 inches thick.)

Substratum: 18-60" Pale brown very gravelly sandy loam, loose to very friable, strongly alkaline. (52 to 58 inches thick.)

Variations: The surface is normally strewn with a 25 to 35 percent gravel fragment cover. Occasional cobble or stone fragments are not uncommon. The texture of the upper profile is predominantly gravelly sandy loam, and gravel content exceeds 35 percent in the lower part of the profile. These soils are very calcareous throughout, but contain no distinct zone of carbonate accumulation.

Setting: The Cliffdown soils occur mainly on bajadas and alluvial fans at elevations between 5,500 and 6,500 feet. Slopes range from 1 to 8 percent and probably average near 3 percent. They are steeper in limited areas.

The summers are hot and dry and the winters are cool to cold. Precipitation is fairly evenly distributed throughout the year, but summer moisture is less effective than that which falls in winter. The mean annual air temperature ranges from 45 to 51°F. The average frost-free season is 80 to 110 days.

Geographically Associated Soils: The Cliffdown soil is associated with the Fang, Ursine, Dun Glen soils, and Xeric Torriorthents. They are differentiated from the Fang soils by not occurring in drainageways, from the Ursine soils by not having a duripan, and from the Dun Glen soils by not having a cambic horizon.

Soil Behavior: Vegetation consists mainly of big sagebrush, winterfat, ephedra, low rabbitbrush, and galleta. The Cliffdown soils have few physical limitations for brush control and reseeding practices; however, low moisture availability during the growing season is the principal limiting factor for these practices.

These soils present few problems for most engineering practices. In some places the coarse fragments on the surface may affect certain uses.

Potential for most types of recreational development is good and conditions are favorable for on-site sewage disposal.

Wildlife habitat for big game species is fair to poor and is good for upland game birds.

Mapping Units:

3837b Cliffdown gravelly sandy loam, 3 to 8 percent slopes. (7,802.9 acres). This soil is a deep gravelly sandy loam. It occurs on gently to moderately sloping alluvial fans.

Inclusions of soils with greater or lesser slopes and other similar soils make up less than 15 percent of this map unit.

(3838) Saltair Series

The Saltair series is a member of the fine-silty, mixed, mesic family of Typic Salorthids. The series consists of deep, very pale brown to brown, poorly drained bottomland soils with a water table at less than 40 inches from the surface. The soils occur in fine textured alluvium derived from mixed geological parent material.

Profile Description: Saltair silt loam

Surface layer: 0-3" White, ¼ to ½ inch salt crust on the surface of a pale brown (moist) silt loam, very friable, strongly saline and alkali. (2 to 6 inches thick.)

Substratum: 3-48" Stratified, pale brown and yellowish brown (moist) silt loam, heavy silty clay loam and light clay, friable, sticky and plastic, saline and strongly alkaline. (Several feet thick.)

Variations: Coarse fragments are less than 5 percent throughout the profile. Color of the entire profile ranges in hue from 7.5YR to 10YR with values (moist) of 5 to 7 and chroma of 2 or 3. (Mottles and low chromas usually associated with poorly drained soils were not observed, apparently due to the high salt and lime content of the soils.) The surface texture ranges from silt loam to silty clay loam to light clay. The texture between 10 and 40 inches averages a silty clay loam, with clay content of 18 to 35 percent. Depth to the water table is less than 40 inches and is sometimes at or near the surface. Salt and alkali content decreases somewhat with depth.

Setting: The Saltair soils occur in nearly level alluvial bottomlands near natural springs or in areas where water tables are near the surface, in Nye County, Nevada. They occur at elevations ranging from 5,500 to 6,500 feet. Slope gradients are 0 to 3 percent and typically are less than 1 percent. The parent materials consists of fine and moderately fine textured, mixed alluvium.

The climate is semiarid with cold winters and hot summers. The mean annual precipitation is between 6 and 10 inches. The mean annual air temperature is 45 to 51°F., and the frost-free season is 80 to 110 days.

Geographically Associated Soils: The Saltair soils are associated with the Fang and Puddle soils. They are distinguished from the Fang and Puddle soils by being finer textured, saline and alkali affected. The Puddle soils also contain a calcic horizon.

Soil Behavior: The Saltair soils have a native vegetation of salt-grass and greasewood. The high water table, salt and alkali content, and flood hazard are the most limiting factors for most range and engineering practices. These soils are poorly suited for recreational development and on-site sewage disposal.

Wildlife habitat is poor for big game, upland game birds and small mammals.

Mapping Unit:

3838a Saltair silt loam, strongly saline, 0 to 3 percent slopes. (649.6 acres). Slopes are dominantely less than 1 percent. The soils in this map unit are dominantely the Saltair silt loam, saline and alkali affected.

Inclusions are less than 20 percent and include other surface textures of the Saltair and Fang saline-alkali phase.

(3839) Puddle Series

The Puddle series is a member of the coarse-loamy, carbonatic, mesic family of Typic Calciorthids. The series consists of deep, light gray or very pale brown, well-drained soils with high lime content. They occur on terminal ends of alluvial fans as low terraces above poorly drained bottomlands. The soils have a massive, gravelly, soft, caliche layer at shallow depths.

Profile Description: Puddle gravelly sandy loam

Surface layer: 0-7" Light gray to pale brown gravelly sandy loam, very friable, strongly calcareous and strongly alkaline. (4 to 12 inches thick.)

Subsurface layer: 7-17" Very pale brown gravelly sandy loam, very friable, strongly calcareous, and strongly alkaline. (6 to 14 inches thick.)

Substratum: 17-40"+ Very pale brown gravelly loam, massive gravelly caliche, high lime gravels are hard calcium carbonate nodules, strongly alkaline. (Several inches to several feet thick.)

Variations: Coarse fragment content (mainly gravels) is 15 to 25 percent in the surface layer and 20 to 35 percent in the substratum. The gravels are mainly hard, indurated lime nodules about ½ to 2 inches in diameter. Besides the hard lime nodules, the lime in the profile is mainly in a soft powdery form. Values are high throughout the profile, ranging from 5 to 8 dry and moist, chromas are 2 or 3. Textures are typically sandy loam, but include fine sandy loam and loam. Lime content usually decreases below about 3 feet. Substrata below the calcic horizon are usually gravelly and cobbly.

Setting: The Puddle soils occur on moderately sloping fans or low terraces above bottomlands with high water tables, in Nye County, Nevada. They occur at elevations of 5,500 to 6,500 feet. Slope gradients are 3 to 8 percent. The parent materials are from mixed sedimentary and igneous rocks.

The climate is semiarid with cold winters and hot summers. The mean annual precipitation is between 6 and 10 inches. The mean annual air temperature is 45 to 51°F., and the frost-free season is 80 to 110 days.

Geographically Associated Soils: The Puddle soils are associated with soils in the Cliffdown and Saltair series. The Cliffdown and Saltair soils lack a calcic horizon and the Saltair soils are finer textured with a water table at less than 40 inches.

Soil Behavior: The native vegetation consists of low rabbitbrush, horsebrush, shadscale, budsage, winterfat, and galleta grass. Winterfat is probably the best indicator species for assessing range condition. The Puddle soils have few physical limitations for most range brush eradication and reseeding practices, however, low rainfall is the most limiting factor for these practices. These soils have few limitations for most engineering practices.

Potential for recreation development is fair to poor. The soils are well suited for on-site sewage disposal, however, surface traffic powders the soils, making them dusty and subject to erosion.

Wildlife habitat is fair to poor for big game species, upland game birds, and small mammals.

Mapping Unit:

3839a Puddle fine sandy loam, 0 to 3 percent slopes. (582.8 acres). Slopes are dominantly 0 to 3 percent. The principal soil in this map unit is the Puddle fine sandy loam.

Inclusions are less than 20 percent and include other surface textures of Puddle series (e.g., gravelly loamy sand). Also

included are narrow gravelly washes that dissect the unit and soils in the Cliffdown and Fang series.

3839b Puddle gravelly sandy loam, 3 to 8 percent slopes. (653.3 acres) Slopes are dominantly 3 to 8 percent. The principal soil in this map unit is the Puddle gravelly sandy loam.

Inclusions are less than 20 percent and include other surface types of Puddle series (e.g., gravelly loamy sand). Also included are soils in the Fang and Cliffdown series as well as narrow gravelly washes that dissect the unit.

(3840) Rock Outcrop

The Rock Outcrop was not classified according to Soil Taxonomy (USDA-SCS, 1975). It is classified as a land type according to the Soil Survey Manual (USDA-SCS, 1951). The Rock Outcrop consists mainly of outcrops of igneous rocks with associated shallow and very shallow stony soils. These soils are classified as loamy-skeletal Lithic Xeric Torriorthents and Lithic Xerollic Haplargids. Limited areas of Rock Outcrop are found on sedimentary and metamorphic rocks.

Profile Description: Rock Outcrop

Raw, consolidated or soft geologic materials.

Variations: The raw geological character (rock outcrop and steepness) of this land type is so overriding that any soil characteristics are relegated to only minor significance.

Setting: The Rock Outcrop occurs mainly as exposed bare rock or with a thin soil mantle on steep to very steep mountains and hills. Slopes range from 15 to 60 percent, but are mainly near the upper end of the range. Elevation range extends from 5,500 to 8,000 feet.

The summers are hot and dry and the winters are cool to cold. Precipitation, about 6 inches at lower elevations to 14 inches at higher elevations, is fairly evenly distributed throughout the year, but summer moisture is less effective than that which falls in winter. The mean annual air temperature ranges from 51°F. at lower elevations to 41°F. at higher elevations. The average frost-free season ranges from 60 to 100 days, being largely dependent on elevation.

Soil Behavior: The Rock Outcrop has a moderate amount of shrubs, including sagebrush, ephedra and cowania, with scattered juniper and pinon where a shallow soil or soft rock exists. Rock outcrop specifically has little or no vegetative cover.

Because of steep slopes, bare rock and shallow soil, this land type has severe limitations for most uses except as watershed and wildlife habitat. Runoff is very rapid and the hazard of erosion is very severe. Most of this land type has a high scenic value.

Rock Outcrop is used mainly for limited grazing, wildlife habitat, and watershed.

Mapping Units:

3840de Rock outcrop, Lithic Xeric Torriorthents and Lithic Xerollic Haplargids, 15 to 60 percent slopes. (43,988.7 acres). This map unit consists mainly of igneous rock outcrop and associated shallow and very shallow soils. In some areas, this unit consists of sedimentary or metamorphic rock outcrop.

Typically, the rock outcrop makes up 40 to 60 percent of the map unit, and the shallow and very shallow stony soils make up 40 to 60 percent; however, some local areas have as much as 85 percent rock outcrop and other areas as little as 25 percent rock outcrop.

Inclusions are less than 15 percent of the map unit and include small pockets of deeper soils and areas of less slope which occur at random. Also included are areas of very stony colluvial soil at the base of hills and mountains.

(3841) Xeric Torriorthents

This unnamed soil is classified mainly as sandy-skeletal Xeric Torriorthents. It also qualifies as a land type according to the Soil Survey Manual (USDA-SCS, 1951). The Xeric Torriorthent occurs on steep areas that have been badly cut by recent erosion and and soil profile arrangement has been largely destroyed. Relief varies from about 20 to 100 feet. Gullying has occurred primarily in unconsolidated valley-filling material, although erosion has truncated old hardpans on some slopes.

Profile Description: Xeric Torriorthents

Raw unconsolidated gravelly and sandy old valley-filling sediments on steep slopes and narrow ridges.

Variations: The raw character and steep slopes of these areas are so overriding that any soil characteristics are relegated to only minor significance. Areas between ridges are usually occupied by narrow arroyos that are subject to flooding. The arroyo bottoms are normally filled with gravelly and sandy material, but in some cases may have finer-textured material.

Setting: The Xeric Torriorthents occurs mainly as deeply dissected calcareous old alluvial fans or bajadas. Slopes range from 15 to 60 percent, but are mainly between 30 and 40 percent. Elevation range extends from 5,500 to 8,000 feet.

The summers are hot and dry and the winters are cool to cold. The mean annual precipitation of 6 to 12 inches is fairly evenly distributed throughout the year. The mean annual air temperature ranges from 41°F to 51°F. The average frost-free season ranges from 60 to 110 days.

Soil Behavior: The Xeric Torriorthent has a moderate amount of shrubs, including black sagebrush, ephedra, bitterbrush, with scattered juniper. Juniper is confined mainly to north facing slopes, or at higher elevations. Large areas of this land type are nearly barren.

Because of steep slopes and coarse fragments, this soil has severe limitations except as watershed and wildlife habitat. Runoff is very rapid and erosion hazard is severe.

This land type which has scenic value is used mainly for limited grazing, wildlife habitat and watershed.

Mapping Units:

3841deSS Xeric Torriorthents, 15 to 60 percent slopes. (27,976.0 acres). This mapping unit consists mainly of steep, severely eroded, and dissected land. Soil materials are mainly cobble, gravel, and sand and may or may not be calcareous. The family classification is sandy skeletal.

Inclusions are less than 15 percent of Fang and Ursine soils, and occassional small areas of rock outcrop.

(3842) Xeric Torriorthents and Xerollic Camborthids

These unnamed soils are classified as loamy-skeletal and sandy-skeletal, Xeric Torriorthents and Xerollic Camborthids. It also qualifies as a land type according to the Soil Survey Manual (USDA-SCS, 1951). This undifferentiated group consists of areas that have enough stones and cobbles to submerge other soil characteristics. As much as 90 percent of the surface may be covered with cobble and stone, whereas the lower limit is near 15 percent. However, a 50 percent cover is typical.

Profile Description: Xeric Torriorthents and Xerollic Camborthids

50 percent cover of cobble and stone that overlies shallow to deep very stony loamy or sandy soils. The Torriorthents have no profile development, whereas the Camborthids have a thin layer leached of carbonates with a mild accumulation of carbonates in the lower profile. Both soils are essentially mono-textured and very stony throughout.

Variations: The stony and cobbly character of these soils is so overriding that any soil characteristics are relegated to only minor significance. However, the coarse fragments may directly overlie bedrock or a weakly developed soil profile.

Setting: The Xeric Torriorthents and Xerollic Camborthids occur mainly on moderately sloping to moderately steep areas in hilly upland terrain and the upper parts of alluvial fans. Slopes range from 3 to 60 percent but are mainly 10 to 30 percent. Elevation range extends from 5,500 to 8,000 feet.

The summers are hot and dry and the winters are cool to cold. Precipitation ranges from about 6 inches at lower elevations to 12 inches at higher elevations. The mean annual temperature ranges from 41°F. at lower elevations to 51°F. at higher elevations. The average frost-free season ranges from 60 to 110 days, being largely dependent on elevation.

Soil Behavior: The Xeric Torriorthents and Xerollic Camborthids have a scant cover of vegetation in most places, which consists mainly of sagebrush and ephedra with scattered juniper and pinon trees.

Because of coarse fragments, and steep slopes on some mapping units, this land type has severe limitations for most uses. It serves primarily as watershed and wildlife habitat. Runoff is rapid, and erosion hazard is moderate. Most of this land type has a high scenic value.

Mapping Units:

3842bSS Xeric Torriorthents and Xerollic Camborthids, 3 to 8 percent slopes. (5,324.1 acres). This map unit consists mainly of areas on the upper ends of alluvial fans on uplands that are strewn with cobble and stones. The coarse fragments are usually igneous and have a nearby source. The soils are stony throughout with loamy to sandy textures in the interstices. They may or may not have a weakly developed profile.

Inclusions are less than 20 percent of the map unit and include small areas that have little or no coarse fragment cover, or, are more than 8 percent slope or less than 3 percent.

3842cSS Xeric Torriorthents and Xerollic Camborthids, 8 to 15 percent slopes, (3,479.8 acres). This map unit consists mainly of areas on the upper ends of alluvial fans on rolling uplands that are strewn with cobble and stones. The coarse fragments are usually igneous and have a nearby source. The soils are stony throughout with loamy to sandy textures in the interstices. They may or may not have a weakly developed profile.

Inclusions are less than 20 percent of the map unit and include small areas that have little or no coarse fragment cover, or are more than 15 percent slope or less than 8 percent.

3842dSS Xeric Torriorthents and Xerollic Camborthids, 15 to 30 percent slopes. (93.4 acres). This map unit consists mainly of rolling upland areas that are largely covered with cobble and stone. The coarse fragments are usually igneous and from a nearby source. The soils are stony throughout with loamy to sandy textures in the interstices. They may or may not have a weakly developed profile.

Inclusions are less than 20 percent of the map unit and include small areas that have little or no coarse fragment cover or have slopes outside those defined for the mapping unit.

(3850) Ursine Series

The Ursine series is a member of the loamy-skeletal, carbonatic, mesic, shallow family of Xerollic Durorthids. The series consists of shallow, very pale brown to yellowish brown gravelly soils. They are well-drained and have developed on coarse textured, valley-filling materials. They occur in areas receiving 6 to 8 inches of precipitation and on landscapes that are mainly moderately to strongly sloping.

Profile Description: Ursine gravelly sandy loam

Surface layer: 0-4" Very pale brown to dark yellowish brown, gravelly sandy loam, soft to very friable, moderately alkaline. (2 to 6 inches thick.)

Subsurface layer: 4-14" Very pale brown to brown (white in lower part) very gravelly sandy loam, soft to very friable, strongly alkaline. (8 to 12 inches thick.)

Substratum: 14-18" White indurated duripan, extremely hard, does not slake in acid. (A few inches to a few feet thick.)

Variations: The surface texture ranges from gravelly loam to very gravelly sand. The surface is usually strewn with a 10 to 50 percent cover of limestone cobbles and stones. The duripan is between 12 and 20 inches thick and is very hard. Slopes of 10 to 12 percent dominate the landscape where this soil occurs, although they exceed 15 percent on the upper parts of fans.

Setting: The Ursine soils occur on the upper parts of alluvial fans and bajadas at elevations between 5,500 and 6,500 feet. Slopes are usually between 8 and 20 percent.

The summers are hot and dry and the winters are cool to cold. Precipitation is fairly evenly distributed throughout the year. Then mean annual air temperature ranges from 45 to 51°F. The average frost-free season is 80 to 110 days.

Geographically Associated Soils: The Ursine soils are associated with the Rock Outcrop, Xeric Torriorthents, and Xerollic Camborthids, Cliff-down, Fang, and Indian Creek soils. It is distinguished from all these soils except Indian Creek by having a duripan, and from Indian Creek by not having an argillic horizon.

Soil Behavior: Vegetation consists mainly of low sagebrush and ephedra with occasional scattered juniper.

Because this soil is shallow and stony, it has very little potential for anything other than watershed and wildlife habitat.

Mapping Units:

3850cs Ursine cobbly loamy sand, 8 to 15 percent slopes. (1,778.0 acres). The soils of this unit are mainly those that belong to the shallow, gravelly Ursine series. They occur mainly on the upper parts of alluvial fans and bajadas. Their surface is strewn with a 15 to 35 percent cover of cobble and stones.

Inclusions are less than 20 percent of the map unit. These include other types and phases of Ursine soils and narrow gravelly washes and short steep slopes adjacent to the washes that dissect the unit.

3850dSS Ursine very stony loamy sand, 15 to 30 percent slopes. (493.7 acres). The soils of this unit are mainly those that belong to the shallow, gravelly Ursine series. They occur mainly on the upper parts of alluvial fans. Their surface is strewn with a 35 to 60 percent cover of cobble and stone.

Inclusions are less than 20 percent of the map unit. These include other types and phases of Ursine soils and narrow gravelly washes and short steep slopes adjacent to the washes that dissect the unit.

3850-3851b Ursine-Dun Glen association, 3 to 8 percent slopes. (2,962.1 acres). This association occurs on broad dissected bajadas and fans that slope from areas of Rock Outcrops to lower terraces or bottomlands. Slopes are mainly 3 to 8 percent. This association is about 40 percent Ursine gravelly sandy loam, and about 40 percent Dun Glen sandy loam.

The Ursine soils, which have a duripan at shallow depths, occur on the tops and upper sideslopes of the small ridges within the mapping unit. The Dun Glen soils occupy the lower sideslopes, nearly flat areas, and some wide drainage bottoms. They do not contain a duripan.

Included in mapping and making up about 20 percent of the mapped acreage are areas of Deerlodge and gravelly sandy washes that dissect the units.

(3851) Dun Glen Series

The Dun Glen series is a member of the coarse-loamy, mixed mesic family of Typic Camborthids. The series consists of deep, very pale brown to dark yellowish brown sandy soils. They are well-drained and are derived mainly from valley-filling materials that have a high content of sand. They occur on landscapes that are mainly nearly level to moderately sloping.

Profile Description: Dun Glen sandy loam

Surface layer: 0-4" Very pale brown to yellowish brown sandy loam, soft to very friable, mildly alkaline. (3 to 10 inches thick.)

Subsoil: 4-17" Pale brown to dark brown heavy sandy loam, friable, mildly alkaline. (6 to 18 inches thick.)

Substratum: 17-40" Very pale brown to dark brown sandy loam, very friable, strongly alkaline. (25 to greater than 40 inches thick.)

Variations: The surface texture may be silt loam, sandy loam, loamy sand or gravelly sandy loam. The texture of the subsoil ranges from light sandy loam to heavy sandy loam, and is noncalcareous. The substratum is calcareous and usually gravelly. Chromas in the subsoil are 2 or 3. Some areas of this soil are subject to ponding and have accumulated a silty surface horizon. These silty soils are usually mapped in complex with other Dun Glen types.

Setting: The Dun Glen soils occur on terraces, broad alluvial fans and bajadas at elevations between 5,500 and 6,500 feet. Slopes are usually between 1 and 8 percent.

The summers are hot and dry and the winters are cool to cold. Precipitation is fairly evenly distributed throughout the year and is 6 to 8 inches.

The mean annual air temperature ranges from 45 to 51°F. The average frost-free season is 80 to 110 days.

Geographically Associated Soils: The Dun Glen soils are associated with the Fang and Alcorn soils. They differ from the Fang by having a cambic horizon and from the Alcorn by having lower chromas in the solum and by being more calcareous and gravelly. Also associated are soils in the Deerlodge series, which have duripans at moderate depths.

Soil Behavior: Vegetation consists mainly of big sagebrush, low rabbitbrush, winterfat, and occasional clumps of galleta. The Dun Glen soils have few physical limitations for most range brush eradication and reseeding practices. However, low rainfall is the most limiting factor for success of reseeding. This soil has few limitations for most engineering practices.

Recreational development potential is good; however, surface traffic causes the surface soils to become dusty and easily eroded. The soils are well suited for on-site sewage disposal.

Wildlife habitat for big game species is fair to poor and is good for upland game birds.

Mapping Units:

3851a Dun Glen sandy loam, 0 to 3 percent slopes. (3,562.6 acres). Slopes are dominantly 1 to 3 percent. The soils of this unit are mainly those that belong to the deep, sandy loam Dun Glen series. They occur mainly on lower bajada positions or on low terraces.

Inclusions are less than 20 percent. These include other types and phases of Dun Glen and Deerlodge soils. Also included are narrow sandy gravelly washes that dissect the unit and some limited areas of deep sandy soils.

3851b Dun Glen sandy loam, 3 to 8 percent slopes. (600.1 acres). This map unit is the same as 3851a Dun Glen sandy loam, 0 to 3 percent slopes, except it occurs on steeper slopes. Slopes are dominantly 3 to 6 percent.

3851-3851a1 Dun Glen association, 0 to 3 percent slopes. (1,040.4 acres). The soils of this unit are mainly those that belong to the deep Dun Glen series. The individual components of this mapping unit, the Dun Glen sandy loam and Dun Glen silt loam occur in nearly equal amounts.

Inclusions are less than 20 percent and are mainly other types and phases of Dun Glen soils.

(3852) Spanel Series

The Spanel series is a member of the loamy, mixed, mesic, shallow family of Typic Durargids. The series consists of loamy, light colored, calcareous soils that have an argillic horizon and a hard duripan at shallow depths. They are well-drained and have developed on medium to moderately coarse textured valley-filling sediments. They occur in areas receiving 6 to 8 inches of precipitation on landscapes that are moderately to strongly sloping.

Profile Description: Spanel gravelly sandy loam

Surface layer: 0-4" Light gray to dark grayish brown gravelly sandy loam, friable, calcareous, moderately alkaline. (2 to 6 inches thick.)

Subsoil: 4-12" Light gray to brown gravelly sandy clay loam, friable, calcareous, moderately alkaline. (5 to 14 inches thick.)

Substratum: 12"+ Hard indurated silica duripan, strongly calcareous.

Variations: Depth to the duripan ranges from 10 to 20 inches and is typically about 14 inches. Coarse fragment content varies within the profile and substratum. The surface usually has a thin veneer of gravel covering 20 to 40 percent of the surface area. Within the A and B horizons, coarse fragments are usually less than 15 percent. The C horizon has 15 to 35 percent lime coated gravel and durinodes. The duripan is indurated. The duripan and underlying strata are frequently very gravelly and cobbly. The A horizon has values of 6 or 7 dry and 4 to 6 moist with chromas of 2 or 3. The texture of the A horizon is almost always a sandy loam, but includes loam and light sandy clay loam. The B horizon (argillic) has values of 5 or 6 dry and 4 or 5 moist with chromas of 3 or 4. The texture of the B

horizon is heavy sandy loam or light sandy clay loam with 18 to 24 percent clay. The Cca horizon has values one higher than the B horizon. The texture of the Cca horizon is typically gravelly sandy loam with 15 to 35 percent gravel and durinodes. The entire profile is typically calcareous, but may be noncalcareous in the upper solum. The duripan is coarse platy with silica lamine and opal pendants on the lower parts of the plates.

Setting: The Spanel soils occur on moderately sloping old alluvial fans in valley-filling sediments in Nye County, Nevada, at elevations of 6,000 to 6,500 feet. Slope gradients range from 3 to 8 percent. The mean annual precipitation is 5 to 10 inches. The mean annual air temperature is 45 to 51°F. The frost-free season is 90 to 110 days.

Geographically Associated Soils: The Spanel soils are associated with soils of the Dun Glen, Fang, and Indian Creek soils. The Dun Glen and Fang soils lack a duripan. The Indian Creek soil is somewhat similar, but contains a more clayey argillic horizon.

Soil Behavior: The vegetation consists of bud sagebrush, spiny hopsage, shadscale, low rabbitbrush, Bailey greasewood, Indian ricegrass, and squirreltail. These soils pose few mechanical limitations for brush control and range reseeding practices; however, the shallow depth to duripan and low rainfall make these soils respond slowly to most range management practices.

The shallow depth to duripan is the most limiting factor for most engineering practices.

Potential for recreational development is poor, and shallow depth to duripan make these soils unsuited for on-site sewage disposal.

Wildlife habitat is fair to poor for big game species, upland game birds, and small mammals.

Mapping Units:

3852b Spanel gravelly sandy loam, 3 to 8 percent slopes. (33,497.1 acres). Slopes are undulating with gradients of 3 to 8 percent. The principal soil in this map unit is the Spanel gravelly sandy loam.

Inclusions are less than 20 percent. These include other types and phases of Spanel soils and Dun Glen soils. Also included are narrow, gravelly washes that dissect the unit and some short, steep, cobbly slopes adjacent to the washes and on the terminal ends of fans.

3852bS Spanel stony, gravelly sandy loam, 3 to 8 percent slopes. (4,017.9 acres). Slopes are typically about 5 percent. The principal soil in this unit is the Spanel stony, gravelly sandy loam.

This map unit is very similar to the 3852b map unit except it contains a 15 to 35 percent surface cover of stones and cobbles.

(3853) Alcorn Series

The Alcorn series is a member of the coarse-loamy, mixed, mesic, family of Typic Camborthids. The series consists of deep, pale brown sandy soils. They are well-drained and are derived mainly from valley filling material that has a high content of sand. They occur on landscapes that are mainly nearly level to moderately sloping.

Profile Description: Alcorn loamy sand

Surface layer: 0-8" Pale brown to brown loamy sand, loose to very friable, moderately alkaline. (4 to 12 inches thick.)

Subsoil: 8-20" Yellow to yellowish brown sandy loam, soft to very friable, moderately alkaline. (8 to 20 inches thick.)

Substratum: 20-60" Yellow to yellowish brown sandy loam and gravelly loamy sand, soft to very friable, moderately to strongly alkaline. (28 to 48 inches thick.)

Variations: The surface texture may be sandy loam, loamy sand, or gravelly sandy loam. The texture of the subsoil ranges from light sandy loam to heavy sandy loam and is noncalcareous. The substratum is usually noncalcareous, but may be calcareous in some locations. Chromas in the subsoil normally are high. Gravel is common in the substratum, but usually does not exceed 30 percent.

Setting: The Alcorn soils occur on broad alluvial fans and bajadas at elevations between 5,500 and 6,500 feet. Slopes are usually between 1 and 8 percent.

The summers are hot and dry and the winters are cool and cold. Precipitation is fairly evenly distributed throughout the year and is 6 to 8 inches.

The mean annual air temperature ranges from 45 to 51°F. The average frost-free season is 80 to 100 days.

Geographically Associated Soils: The Alcorn soils are associated with the Fang and the Dun Glen soils. They differ from the Fang by having a cambic horizon and from the Dun Glen by having higher chromas in the solum, and being less calcareous and gravelly.

Soil Behavior: Vegetation consists mainly of big sagebrush, rabbitbrush, shadscale, and occasional clumps of galleta. The Alcorn soils have few physical limitations for most range brush eradication and reseeding practices. However, low rainfall is the most limiting factor for these practices.

The most serious problem associated with this soil is its susceptibility to wind erosion. There are few limitations for engineering practices and the soil is well suited to on-site sewage disposal.

Wildlife habitat for big game species is fair to poor and is good for upland game birds.

Mapping Units:

3853a Alcorn loamy sand, 0 to 3 percent slopes. (3,999.1 acres). Slopes are dominantly 1 to 3 percent. The soils of this unit are mainly those that belong to the deep, sandy, Alcorn series. They occur mainly on lower bajada positions or on the lower ends of alluvial fans.

Inclusions are less than 20 percent. These are mainly other types and phases of Alcorn soils and soils in the Dun Glen and Cliffdown series.

3853b Alcorn loamy sand, 3 to 8 percent slopes. (1,738.3 acres). Slopes dominantly are 3 to 8 percent. The soils of this unit are mainly those that belong to the deep, sandy, Alcorn series. They occur mainly on upper and intermediate bajada positions or on alluvial fans.

Inclusions are less than 20 percent. These include mainly other types and phases of the Alcorn soils and soils in the Dun Glen and Cliffdown series.

(3854) Indian Creek Series

The Indian Creek series is a member of the clayey, montmorillonitic, mesic, shallow family of Xerollic Durargids. The series consists of shallow, light yellowish brown to dark yellowish brown well-drained upland soils with a duripan at 8 to 16 inches. The soils occur in valley-filling sediments on old alluvial fans.

Profile Description: Indian Creek gravelly loamy sand

Surface layer: 0-4" Light gray to grayish brown gravelly sandy loam, nonsticky, nonplastic, mildly alkaline. (2 to 6 inches thick.)

Subsoil: 4-12" Light yellowish brown to yellowish brown sandy clay, friable, moderately alkaline, calcareous and gravelly in the lower part. (6 to 14 inches thick.)

Substratum: 12"+ Silica and lime cemented duripan, moderately to strongly alkaline. (several inches to several feet thick.)

Variations: Depth to the duripan ranges from 8 to 16 inches. A thin layer of gravel may cover 15 to 60 percent of the surface; however, coarse fragments in the surface and upper argillic horizon are usually less than 15 percent by volume. If present, the B2tca horizon usually has 15 to 35 percent gravel and cobble, but may have up to 50 percent. The duripan and substratum are usually very gravelly and cobbly. The A horizon has value of 6 to 7 dry and 4 or 5 moist, with chroma of 3 to 4. The B horizons have value of 4 to 5 dry and 4 or 5 moist, with chroma of 4 to 6. The surface texture ranges from sandy loam to loamy sand or sand and may or may not be gravelly. The subsoil texture is dominantly sandy clay and may or may

not be gravelly in the lower part. The upper part of the profile is usually noncalcareous, becoming strongly calcareous in gravelly layers just above the duripan.

Setting: The Indian Creek soils occur on gently sloping to moderately steep upland fans in broad basins in Nye County, Nevada, at elevations of 5,500 to 6,500 feet. Slope gradients range from 3 to 30 percent. The soils have formed in old valley filling sediments on upland fans. The parent materials are from a wide range of sedimentary and igneous rocks.

The climate is arid with cool winters and hot summers. The mean annual precipitation is between 8 and 10 inches. The mean annual air temperature is 45°F. to 51°F. The frost-free period is 80 to 110 days.

Geographically Associated Soils: The Indian Creek soils are associated with Deerlodge, Fang, and Alcorn soils. The Indian Creek soils are distinguished from the Deerlodge soils by being shallow to a duripan. Both the Fang and the Alcorn soils are deep, coarse loamy and lack an argillic horizon and duripan.

Soil Behavior: The vegetation consists of low rabbitbrush, sage, shadscale, winterfat, and galleta grass. Winterfat is probably the best indicator plant for range conditions. Low rainfall is probably the most limiting factor for successful brush eradication and reseeding practices. Also limiting are the areas having moderately steep slopes and very cobbly, stony surfaces. The shallow depth to the duripan is the most limiting factor for most engineering practices.

Recreational development potential is poor, due to slopes, cobbly stony surface, and easily eroded surface soil. Because of the duripan at shallow depths, these soils are unsuited for on-site sewage disposal.

Wildlife habitat is fair to poor for big game species and poor for upland game birds and small mammals.

Mapping Units:

3854b Indian Creek gravelly loamy sand, 3 to 8 percent slopes. (1,179.8 acres). The soils in this unit are dominantly the shallow Indian Creek series, occurring on old upland fans.

Inclusions are 15 to 20 percent. They are made up of the Indian Creek very shallow, cobbly stony soil, soils of the Deerlodge series, and small outcrops of bedrock. Also included are narrow, gravelly washes with stony, cobbly sideslopes, and small areas with a non-gravelly surface texture.

3854bcSS Indian Creek very cobbly sandy loam, 3 to 15 percent slopes. (1,205.5 acres). Slopes are complex on high fans with considerable relief. The tops of the fans have gradients of 3 to 8 percent with the sides and toes of the fans having gradients of 8 to 15 percent. The principal soil in this map unit is the Indian Creek very cobbly sandy loam.

Inclusions are less than 20 percent of the map unit. These include other types and phases of Indian Creek soils as well as soils in the Deerlodge series. Also included are narrow sandy gravelly washes that dissect the unit.

3854-3853b Indian Creek-Alcorn association, 3 to 8 percent slopes. (1,703.6 acres). Slopes are 3 to 8 percent. This unit consists of about 50 percent Indian Creek gravelly loamy sand and 30 percent Alcorn gravelly loamy sand. The Indian Creek soils occur mainly on ridgetops and in areas with convex slopes. The Alcorn soils occur mainly in swale positions with concave slopes.

Inclusions make up about 20 percent of the map unit. They include mainly soils in the Cliffdown, Dun Glen and Deerlodge series. Also included are narrow gravelly washes which dissect the unit.

(3856) Olson Series

The Olson series is a member of the loamy, mixed, frigid, shallow family of Xerollic Durargids. It consists of shallow, pale brown, well-drained soils that have a sandy clay loam argillic horizon over a platy indurated duripan at depths of less than 20 inches. The soils formed on old alluvial fans in valley-filling sediments from mixed igneous sources. They occur on nearly level to moderately sloping somewhat rolling fans.

Profile Description: Olson gravelly sandy loam

Surface layer:	0-4"	Light gray to brown gravelly sandy loam, very friable, neutral to mildly alkaline. (3 to 6 inches thick.)
Subsoil:	4-14"	Pale brown to brown sandy clay loam, friable, neutral to moderately alkaline upper part, moderately to strongly alkaline lower part. (4 to 16 inches thick.)
Substratum:	14-30"	Very pale brown and white, laminated, indurated silica duripan, extremely hard, strongly calcareous, strongly alkaline. Several inches thick.

Variations: Depth to duripan ranges from 10 to 20 inches and is typically about 14 inches. Coarse fragment content varies within the solum and substratum. The surface usually has a thin veneer of gravel (desert pavement) covering 30 to 90 percent of the surface area. Within the A and B2t horizon, coarse fragments are usually less than 15 percent. Typically, the lower half of the B horizon is calcareous and has 15 to 35 percent gravel and cobble. The duripan and underlying strata are frequently very cobbly and stony. The A horizon has values of 6 or 7 dry, and 4 to 6 moist with chromas of 2 or 3. Texture of the A horizon is sandy loam, loam or sandy clay loam, with some

surface gravel. The B horizon has values of 5 to 6 dry, and 4 to 5 moist with chromas of 3 or 4. Where the lower part is calcareous, the values are usually 1 value higher dry and moist. Texture of the B2t horizon is sandy clay loam or light clay loam with less than 35 percent clay. The duripan is coarse platy with silica lamina and opal pendants on the lower sides of plates. Thin interplate strata of white indurated calcium carbonate is a common feature as well as a thick carbonate coating on the lower edges of the plates.

Setting: The Olson soils occur on nearly level to moderately sloping, old alluvial fans in valley-filling sediments, in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients range from 0 to 8 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipitation is between 8 and 12 inches. The mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Olson soils are associated with Haploxerollic Durorthid and Xerollic Haplargid soils, and Rock Outcrop. The Haploxerollic Durorthid soils lack an argillic horizon and both the Haploxerollic Durorthid and Xerollic Haplargid soils lack a duripan.

Soil Behavior: The vegetation consists of big sagebrush, low rabbitbrush, Indian ricegrass, and squirreltail. In addition, the upper slopes have occasional juniper, pinon and blue grama grass. Except for the stony phase, the soils pose few mechanical limitations for brush control and reseeding practices; however, the shallow depth to duripan and low rainfall make these soils respond slowly to most range management practices. The shallow depth to the duripan is the most limiting factor for most engineering practices.

These soils have poor recreational development potential and because of the shallow depth to duripan, are unsuited for on-site sewage disposal.

Wildlife habitat for big game species is fair to poor and is fair to poor for upland game birds and small mammals.

Mapping Units:

3856a Olson gravelly sandy loam, 0 to 3 percent slopes. (16,644.3 acres). Slopes are dominantly 0 to 3 percent. The principal soils in this map unit are the Olson gravelly sandy loam and loam.

Inclusions are less than 20 percent. These include the Ratto series that occurs at random, steeper slope phase of the Olson series that has cobbly surfaces and occur on sideslopes of fans adjacent to drainageways. Also included are narrow gravelly sandy washes that occur in the drainageways.

3856aS Olson cobbly sandy loam, 0 to 3 percent slopes. (367.8 acres). This map unit is very similar to the 3856a Olson gravelly sandy loam, 0 to 3 percent slopes except it contains 15 to 35 percent surface cobbles with some stones.

3856b Olson gravelly sandy loam, 3 to 8 percent slopes. (16,754.2 acres). Slopes are dominantly 3 to 8 percent. This map unit is very similar to the 3856a map unit except for slope.

3856bS Olson cobbly sandy loam, 3 to 8 percent slopes. (7,616.0 acres). Slopes are dominantly 3 to 8 percent. Slopes are complex with the lesser slopes occurring on tops of fans and greater slopes occurring on sides of fans adjacent to drainageways. The principal soil in this map unit is the cobbly and/or stony sandy loam phase of the Olson series.

Inclusions are less than 20 percent. These include noncobbly, stony phases of the Olson series, small areas of Rock Outcrop, and narrow areas of gravelly, cobbly and stony washes that occupy narrow drainageways that dissect the unit.

3856cds Olson cobbly sandy loam, 8 to 30 percent slopes. (1,447.2 acres). Slopes are complex on high fans with considerable relief. The tops of the fans have gradients of 8 to 15 percent and sideslopes with gradients of 15 to 30 percent.

Inclusions are less than 20 percent and include some Xeric Torriorthents and other types and phases of Olson soils as well as narrow gravelly washes that dissect the unit.

3856-3858a Olson-Haploxerollic Durorthid complex, 0 to 3 percent slopes. (1,992.0 acres). This map unit occurs on 0 to 3 percent slopes. The Olson and Haploxerollic Durorthid occur in nearly equal amounts at random throughout the map unit.

Inclusions make up about 20 percent of the map unit and include soils in the Xerollic Haplargid, Shipley and Bereniston series. Also included are narrow gravelly washes which dissect the unit.

3856-3861b Olson-Haploxerollic Durorthid complex, 3 to 8 percent slopes. (1,199.7 acres). This map unit is nearly identical to the 3856-3858a map unit except it occurs on slopes of 3 to 8 percent.

3856-3861bS Olson-Xerollic Haplargid complex, 3 to 8 prcent slopes. (2,543.5 acres). Slopes are dominantly 3 to 8 percent. About 50 percent of this unit consists of Olson cobbly stony sandy loam and about 30 percent consists of Xerollic Haplargid cobbly stony sandy loam, which occurs at random throughout the map unit.

Inclusions are less than 20 percent and are mainly other types and phases of Olson and Xerollic Haplargid soils. Also included are narrow gravelly washes that dissect the unit.

(3857) Ratto Series

The Ratto series is a member of the clayey, montmorillonitic, frigid, shallow family of Xerollic Durargids. It consists of shallow, pale brown, well-drained soils that have a sandy clay argillic horizon over a platy indurated duripan at depths of less than 20 inches. The soils formed on old alluvial fans in valley-filling sediments from mixed igneous sources. They occur on nearly level to moderately sloping, somewhat rolling hills.

Profile Description: Ratto gravelly sandy loam

Surface layer:	0-4"	Light gray gravelly sandy loam, very friable, neutral to mildly alkaline. (2 to 6 inches thick.)
Subsoil:	4-14"	Very pale brown sandy clay, friable, neutral to moderately alkaline upper part, moderately to strongly alkaline (usually calcareous) lower part. (7 to 14 inches thick.)
Substratum:	14-30"+	Very pale brown and white, laminated, indurated silica duripan, extremely hard, strongly calcareous, strongly alkaline. (Several inches thick.)

Variations: Depth to duripan ranges from 10 to 20 inches and is typically about 14 inches. Coarse fragment content varies within the profile and substratum. The surface usually has a thin veneer of gravel (desert pavement) covering 30 to 90 percent of the surface area. Within the A and B horizon, coarse fragments are usually less than 15 percent. Typically, the lower half of the soil above the duripan is calcareous and has 15 to 35 percent gravel and cobble. The duripan and underlying strata are frequently very cobbly and stony. The A horizon has values of 6 or 7 dry and 4 to 6 moist, with chromas of 2 or 3. Texture of the A horizon is sandy

loam, loam or silt loam with some surface gravel. The B horizon has values of 5 to 6 dry and 4 to 5 moist with chromas of 3 or 4. The Cca horizon has values one value higher than the B horizon dry and moist. The texture of the B and Cca are typically sandy clay with 15 to 35 percent gravel and cobble in the Cca horizon. The duripan is coarse platy with silica lamina and opal pendants of the lower parts of the plates. Thin interplate strata of white indurated calcium carbonate is a common feature as well as a thick carbonate coating on the lower edges of the plates.

Setting: The Ratto soils occur on nearly level to gently sloping, old alluvial fans in valley-filling sediments in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients range from 0 to 8 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipitation is between 8 and 12 inches. The mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Ratto soils are associated with soils of the Olson series, Haploxerollic Durorthid soils and Rock Outcrop. The Olson soils have sandy clay loam argillic horizons; the Haploxerollic Durorthid soils lack an indurated duripan.

Soil Behavior: The vegetation consists of low sage, low rabbitbrush, Indian ricegrass and squirreltail. Except for the stony phase, the soils pose few mechanical limitations for brush control and reseeding practices; however, the shallow depth to duripan and low rainfall make these soils respond slowly to most range management practices.

The shallow depth to duripan is the most limiting factor for most engineeging practices. Potential for recreational development is poor, and shallow depth to duripan make these soils unsuited for on-site sewage disposal.

Wildlife habitat for big game species, upland game birds, and small mammals is fair to poor.

Mapping Units:

3857a Ratto gravelly sandy loam, 0 to 3 percent slopes. (2,307.7 acres). Slopes are dominantly 0 to 3 percent. The principal soil in this map unit is the Ratto gravelly sandy loam.

Inclusions are less than 20 percent. These include other slope and textural phases of the Ratto series, soils in the Olson series which occur at random, and narrow gravelly sandy washes which occur in the bottoms of drainageways that dissect the unit.

3857bS Ratto stony gravelly sandy loam, 3 to 8 percent slopes. (527.8 acres). Slopes are dominantly 3 to 8 percent. This map unit is the same as the 3857a except for slope and surface cobble and stones which cover 15 to 35 percent of the surface.

(3858) Haploxerollic Durorthid

This unnamed soil is a member of the loamy, mixed, frigid shallow family of Haploxerollic Durorthids. It consists of deep, pale brown, well-drained soils that have a sandy loam cambic horizon over stratified silica cemented sandy loams and gravelly loamy sand. The soils formed on old alluvial fans in valley-filling sediments from mixed igneous and sedimentary sources. They occur on nearly level to moderately sloping fans.

Profile Description: Haploxerollic Durorthid sandy loam

Surface layer:	0-6"	Light brownish gray sandy loam, very friable, neutral to mildly alkaline. (2 to 8 inches thick.)
Subsoil:	6-16"	Very pale brown to brown sandy loam, very friable, neutral to mildly alkaline. (8 to 15 inches thick.)
Substratum:	16-40"	Very pale brown to white stratified silica cemented gravelly sandy loam and gravelly loamy sand, very friable, moderately to strongly alkaline with some visible lime accumulation. (Several feet thick.)

Variations: Coarse fragment content varies within the solum and substrata. The surface typically has 5 to 15 percent gravel and may or may not have a thin veneer of gravel covering 20 to 50 percent of the surface area. The cambic horizon (B2) usually has 5 to 15 percent gravel. The substratum is weakly cemented and typically has 15 to 35 percent gravel; however, individual thin strata may be nearly free of gravel or contain 50 to 90 percent. The A horizon has values of 6 or 7 dry and 4 to 5 moist with chromas of 2 or 3. The B2 horizon has values of 6 or 7 dry and 4 or 5 moist with chromas of 3 or 4. The substratum typically has a Cca horizon which has color values one value higher than the B2 with some white lime mottles. The lower substratum has colors similar to the B2 horizon. Texture of the A horizon includes loamy sand, sandy loam, fine sandy loam and loam and may or may not be

gravelly. The B2 horizon is sandy loam or gravelly sandy loam. The substratum is stratified but averages sandy loam in texture.

Setting: The Haploxerollic Durorthid soils occur on nearly level to moderately sloping, old alluvial fans in valley-filling sediments, in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients range from 0 to 8 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipitation is between 8 and 12 inches; the mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Haploxerollic Durorthid soils are associated with soils of the Olson series, Ratto series, and Shipley series. Both the Olson and Ratto series have indurated duripans at shallow depths. The Shipley soils lack a cambic horizon and duripan.

Soil Behavior: The vegetation consists of big sagebrush, low rabbitbrush, Indian ricegrass and squirreltail. These soils pose few mechanical limitations for most brush control and reseeding practices. The low rainfall is the most limiting factor for most range management practices. These soils pose few limitations for engineering practices; however, the moderately rapid permeability may cause some limitations for water impondment.

These soils have poor recreational development potential; however, they are well suited for on-site sewage disposal.

Wildlife habitat for big game species is fair to poor and is fair to good for upland game birds and small mammals.

Mapping Units:

3858a Haploxerollic Durorthid gravelly sandy loam, 0 to 3 percent slopes. (2,056.3 acres). Slopes are dominantly 0 to 3 percent. The principal soil in this map unit is the Haploxerollic Durorthid gravelly sandy loam.

Inclusions are less than 20 percent. These include the Olson and Ratto soils which occur at random, Shipley soils which occur in swales, and gravelly sandy washes in the bottoms of drainageways that dissect the unit.

3858-3859a Haploxerollic Durorthid-Shipley association, 0 to 3 percent slopes. (5,713.9 acres). Slopes are dominantly 0 to 3 percent. This map unit consists of about 50 percent Haploxerollic Durorthid gravelly sandy loam which occurs more often on the more stable surfaces, commonly with convex slopes. About 30 percent of the map unit consists of Shipley gravelly sandy loam which occurs in the drainageways on less stable surfaces, commonly with concave slopes.

Inclusions are about 20 percent. Included in mapping are other types and phases of the Haploxerollic Durorthid and Shipley soils. Also included are small areas of Bereniston soils which occur at random. In addition to the above, narrow areas of gravelly sandy washes dissect the unit.

3858-3859-3860a Haploxerollic Durorthid-Shipley-Bereniston association, saline-alkali, 0 to 3 percent slopes. (3,330.4 acres). Slopes are dominantly 0 to 1 percent. This map unit consists of about 35 percent Haploxerollic Durorthid gravelly sandy loam which occurs as long, narrow ridges, about 30 percent Shipley gravelly sandy loam, saline-alkali, which occurs in nearly flat areas between the ridges of Haploxerollic Durorthid soils, and about 25 percent Bereniston silt loam, saline-alkali, which occurs intermittently with the Shipley soils between the ridges of Haploxerollic Durorthid soils.

Inclusions are about 10 percent and are primarily other types and phases of the Shipley and Bereniston soils. Also included in mapping are numerous, meandering drainage channels that usually have gravelly sandy bottoms.

(3859) Shipley Series

The Shipley series is a member of the coarse-loamy, mixed (calcareous), frigid family of Xeric Torriorthents. It consists of light brownish gray to dark grayish brown, deep, well-drained soils subject to ephemeral flooding. They are alluvial soils that are deposited in drainageways dissecting alluvial fans and on valley floors. The soils are formed from mixed igneous and sedimentary parent materials. They occur on nearly level to gently sloping drainageways and valley floors.

Profile Description: Shipley gravelly sandy loam

Surface layer:	0-4"	Light brownish gray gravelly sandy loam, soft, very friable, neutral to mildly alkaline. 0 to 6 inches thick.
Substratum:	4-60"	Light brownish gray, stratified, silt loam, fine sandy loam, and loamy fine sand which are gravelly for the most part. Friable, mildly to strongly alkaline. Several feet thick.

Variations: Coarse fragment content ranges from 15 to 35 percent and consists mainly of fine gravel. Typically the entire profile contains about 20 percent fine and very fine gravel; however, individual strata may be nearly free of gravel or may be very gravelly. The profile consists of stratified alluvium. Individual strata range in texture, including sandy loam, loam, silt loam, loamy sand, and may or may not be gravelly or very gravelly. The profile averages a gravelly sandy loam texture. Color varies by strata with values of 6 or 7 dry and 3 to 5 moist with chroma of 2 or 3.

Setting: The Shipley soils occur on nearly level to gently sloping fans and floodplains, in valley-filling alluvium, in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients are 0 to 3 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipitation is between 8 and 12 inches. The mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Shipley soils are associated with Olson, Ratto, Haploxerollic Durorthids, and Bereniston soils. Soils of the Olson and Ratto series have duripans at shallow depths. The Haploxerollic Durorthid soils have a cambic horizon. The Bereniston soils have finer-textured control sections than the Shipley series.

Soil Behavior: The vegetation consists of big sagebrush, greasewood, rubber rabbitbrush, Indian ricegrass, squirreltail, blue grama, saltgrass, and sedges. These soils have few mechanical limitations for brush control and reseeding practices. Some areas have been cleared of brush and reseeded with crested wheatgrass with apparently good success. Due to the low rainfall, these soils respond slowly to most range management practices. Some of the soils are subject to ephemeral flooding which poses the most limiting factor for most engineering practices.

These soils have poor recreational development potential. If protected from flooding, these soils are well suited for on-site sewage disposal.

Wildlife habitat is good to fair for big game species and is fair to poor for upland game birds and small mammals.

Mapping Units:

3859a Shipley gravelly sandy loam, 0 to 3 percent slopes. (7,876.1 acres). Slopes are dominantly 0 to 2 percent. The principal soil in this map unit is Shipley gravelly sandy loam.

Inclusions are less than 20 percent. These include other surface

types and saline-alkali phases of the Shipley series, the Haploxerollic Durorthid, and Bereniston soils. Also included are narrow gravelly, sandy washes that dissect the area. Some local areas with very cobbly substratum at depths of 30 to 40 inches were included in mapping.

3859-3860a Shipley-Bereniston complex, saline-alkali, 0 to 3 percent slopes. (10,876.7 acres). Slopes are dominantly 0 to 2 percent. This map unit consists of about 40 percent Shipley gravelly sandy loam and about 40 percent Bereniston silt loam, which occur at random throughout the map unit.

Inclusions are about 20 percent. Other surface types and saline-alkali phases of the Shipley and Bereniston series make up about 10 percent of the mapping unit. Also included are small areas of Haploxerollic Durorthid soils and some narrow, gravelly, sandy washes that dissect the unit.

(3860) Bereniston Series 1/

The Bereniston series is a member of the fine-loamy, mixed (calcareous), frigid family of Xeric Torriorthents. It consists of light brownish gray to dark grayish brown, deep, well-drained soils that are subject to ephemeral flooding. The series consists of alluvial soils deposited in drainageways and in broad, nearly flat alluvial valleys. The soils are formed from mixed igneous and sedimentary parent materials.

Profile Description: Bereniston silt loam

Surface layer:	0-4"	Light brownish gray silt loam or very fine sandy loam, soft, very friable, mildly to strongly alkaline. (0 to 6 inches thick.)
Substratum:	4-60"	Light brownish gray, stratified silt loam, silty clay loam and fine sandy loam, friable, mildly to strongly alkaline. (Several feet thick.)

Variations: Typically the Bereniston soils are free or nearly free of coarse fragments; however, thin strata of very gravelly materials may occur at any depth in the profile. Because of the stratified nature of these soils, color and texture vary with individual strata. Typically, the value is 6 or 7 dry and 3 to 5 moist with chroma of 2. Texture is stratified silt loam, silty clay loam, and sandy loam and averages 18 to 34 percent coarser than very fine sand. Thin strata of very gravelly loamy sand are common.

Setting: The Bereniston soils occur on nearly level to gently sloping floodplains and in broad valleys in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients are 0 to 3 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipitation is 8 to 12 inches. The mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

1/ Taxadjunct due primarily to ranging slightly outside the color value range and in its geographic location.

Geographically Associated Soils: The Bereniston soils are associated mainly with soils of the Haploxerollic Durorthid subgroup and Shipley series. Both the Haploxerollic Durorthid and Shipley soils are coarser-textured. In addition, the Haploxerollic Durorthid soils have a cambic horizon.

Soil Behavior: The vegetation consists of rubber rabbitbrush, big sagebrush, greasewood, saltgrass, sedges, halogeton, and other annual weeds. These soils have few mechanical limitations for brush control and reseeding practices. Some areas have been cleared of brush and reseeded with crested wheatgrass with apparently good success. Due to the low rainfall, these soils respond slowly to most range management practices. The soils are subject to ephemeral flooding which poses the most limiting factor for most engineering practices.

These soils have poor potential for recreational development. If protected from flooding, the soils are moderately well suited for on-site sewage disposal.

Wildlife habitat is fair to poor for big game species, upland game birds and small mammals.

Mapping Units:

3860a Bereniston silt loam, 0 to 3 percent slopes. (2,202.2 acres). Slopes are dominantly 0 to 2 percent. The principal soil in this map unit is the deep medium-textured Bereniston silt loam.

Inclusions are less than 20 percent. These include mainly other types and phases of the Bereniston and Shipley soils such as a fine or very fine sandy loam surface type, saline and alkali spots and small areas with high water tables.

The principal soil in this map unit is a taxadjunct to the Bereniste series, primarily due to ranging slightly outside the color value range and in its geographic setting.

(3861) Xerollic Haplargid

This Unnamed soil is a member of the fine loamy, mixed frigid family of Xerollic Haplargids. It consists of deep light gray to pale brown, well-drained soils that have a sandy clay loam argillic horizon. The soils formed in valley-filling sediments from mixed igneous sources. They occur on moderately sloping to somewhat rolling alluvial fans.

Profile Description: Xerollic Haplargid sandy loam

Surface layer:	0-4"	Light gray to brown sandy loam, very friable, mildly alkaline. (2 to 6 inches thick.)
Subsoil:	4-22"	Very pale brown to brown sandy clay loam, friable, strongly alkaline. (10 to 25 inches thick.)
Substratum:	22-40"	Very pale brown to brown, stratified, very gravelly sandy loam and silt loam, very friable, strongly alkaline. (20 to greater than 40 inches thick.)

Variations: Coarse fragment content varies within the profile. The surface and B2t horizons usually contain less than 15 percent coarse fragments. The substratum is stratified with some layers being very gravelly; however, the gravel is usually fine in size. The surface has value of 6 or 7 dry and 4 or 5 moist with chromas of 2 or 3. The texture is typically sandy loam, but includes light sandy clay loam and may or may not be gravelly. The subsoil has value of 6 or 7 dry; 4 or 5 moist with chromas of 3 or 4. The lower subsoil may be one value higher due to lime content. The texture is typically sandy clay loam and is usually gravelly in the lower part. The substratum has value of 7 or 8 dry and 4 or 5 moist with chromas of 3 or 4. The substratum is stratified so textures are highly variable; however, strata of fine gravel and coarse sand are usually intermittent with silt loams and sandy loams.

Setting: The Xerollic Haplargid soils occur on gently to moderately sloping old alluvial fans, in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients range from 0 to 8 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipitation is between 8 and 12 inches. The mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Xerollic Haplargid soils are associated with soils of the Olson, Ratto, Haploxerollic Durorthid subgroup and Shipley series. Both the Olson and Ratto soils have duripans at shallow depths. The Haploxerollic Durorthid and Shipley soils lack an argillic horizon.

Soil Behavior: The vegetation consists of big sagebursh, low rabbitbrush, Indian ricegrass, and squirreltail. In addition, the upper slopes have occasional juniper and pinon trees and blue grama grass. Except for the stony phase, the soils pose few mechanical limitations for brush control and reseeding practices; however, the low rainfall causes these soils to respond slowly to most range management practices. These soils are well suited for most engineering practices.

Recreational development potential is good and these soils are well suited for on-site sewage disposal.

Wildlife habitat for big game species is fair to poor and is good for upland game birds and small mammals.

Mapping Units:

3861-3856a — Xerollic Haplargid-Olson complex, 0 to 3 percent slopes. (1,330.7 acres). Slopes are dominantly 0 to 3 percent. About 50 percent of this unit consists of Xerollic Haplargid sandy loam and about 30 percent consists of Olson sandy loam, which occur at random throughout the map unit.

Inclusions are about 20 percent and are mainly other types and phases of Xerollic Haplargid and Olson series. Also included are narrow gravelly washes that dissect the unit.

(3862) Hutton Series 1/

The Hutton series is a member of the fine, montmorillonitic, frigid family of Typic Haplaquolls. They are deep, poorly drained and have developed in fine textured alluvium with high water tables. They occur in areas receiving 8 to 12 inches of precipitation on landscapes that are nearly level.

Profile Description: Hutton silty clay loam

Surface layer:	0-7"	Dark gray to very dark brown silty clay loam, friable, calcareous, strongly alkaline. (5 to 10 inches thick.)
Subsoil:	7-36"	Light gray to dark gray silty clay, firm, calcareous, strongly alkaline. (20 to 40 inches thick.)
Substratum:	36-60"	White to light brownish gray silty clay, friable, calcareous, strongly alkaline. (More than 12 inches thick.)

Variations: The surface texture ranges from a silt loam to silty clay, but is typically silty clay loam. Dark surface colors extend into the upper 3 to 6 inches of the B horizon. Texture of the B and C horizons is silty clay or clay with 40 to 55 percent clay. High color values of the C horizon is apparently due to disseminated lime. The entire profile is typically free of coarse fragments; however, gravelly cobbly strata may occur below 40 inches.

Setting: The Hutton soils occur in the lower part of the landscape in alluvial bottoms at elevations of 6,500 to 7,200 feet. Slopes are usually less than one percent.

The summers are warm and dry and winters are cold. Mean annual precipitation is 8 to 12 inches. Precipitation occurs throughout the year with a maximum

1/ Taxadjunct, due primarily to presence of lime and reaction.

occurring during winter months in the form of snow. The mean annual air temperature is between 40 and 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Hutton soils are associated with the Shipley, Bereniston, Olson, and Ratto soils. The Shipley and Bereniston soils are coarser-textured and lack the dark colored surface of the Hutton soil. Both the Olson and Ratto soils have duripans at shallow depths.

Soil Behavior: Vegetation consists mainly of saltgrass, sedges and rubber rabbitbrush. The Hutton soils have few physical limitations for brush eradication and reseeding practices; however, these practices are seldom required. High shrink-swell clays, high water table, and flood hazard pose the most limiting factors for most engineering uses; however, these soils are well suited for shallow ponds and reservoir areas.

Potential for recreational development is poor. These soils are unsuited for on-site sewage disposal.

Wildlife habitat is poor for big game, upland game birds, and small mammals; however, the potential for water development is good.

Mapping Units:

3862a Hutton silty clay loam, 0 to 3 percent slopes. (1,034.4 acres). Slopes are dominantly 0 to 1 percent. The principal soil in this unit is Hutton silty clay loam.

Inclusions are less than 20 percent. These include mainly other types and phases of the Hutton series and minor areas of Shipley and Bereniston soils.

Principal soils in this map unit are a taxadjunct to the Hutton series, primarily due to the presence of lime and reaction.

3862ax Hutton silty clay loam, saline-alkali, eroded, 0 to 3 percent slopes. (455.8 acres). Slopes are dominantly 0 to 2 percent. The principal soil in this map unit is the deep, poorly-drained, clayey soil of the Hutton series. The map unit is severely eroded with vertical-walled erosional pedestals up to 30 inches high. The erosional pedestals average about 12 inches high and cover about 30 percent of the surface area. The soils are saline and alkali with patchy salt crusts occurring at random throughout the unit. Depth to the high water table ranges from near the surface to about 3 feet.

Inclusions are less than 20 percent and are mainly other types and phases of the Hutton soils.

Principal soils in this map unit are taxadjuncts to the Hutton series due to the presence of lime and reaction.

GENETIC KEY

TABLE 2 is a key to the soils of the area that relates each series and its mapping units to major soil-forming factors and soil properties significant to the classification and use of the soils. The information contained in this table will be useful in keying out soils during field studies and in obtaining a quick grasp of the major soil differences in the area.

SOIL CLASSIFICATION

For the purposes of this survey, soils are classified in accordance with the system developed and used by the Soil Conservation Service (USDA-SCS, 1975A). The classifications presented in this report are considered tentative.

There are ten Orders at the highest level of categorization. Three of the ten categories are represented in the survey area. These are: Mollisols, which have thick, well-aggregated surface horizons (mollic epipedons with high base status). Aridisols which have light-colored or thin surface horizons (ochric epipedons), a soil moisture content below permanent wilting point for at least sixty cumulative days during the period the soil is warm enough to support plant growth. Entisols, which are youthful soils exhibiting limited or no development of pedogenic horizons.

TABLE 3 presents the classification of all soils mapped during the survey and is given at the subgroup and family level. The soil order can be determined from the ending of the subgroup classifications. For example, Torrifluvents are Entisols. Those ending in ids are Aridisols, and olls are Mollisols.

TABLE 2

A GENETIC KEY FOR THE SOIL SERIES

Parent Material	Landform	Soil Temperature Class	Epipedon	Diagnostic Subsurface Horizon	Texture of control section	Soil Depth (inches)	Degree of Stoniness 1/	Drainage Class	Taxonomic and Map Units 2/
Recent alluvium	Alluvial bottoms	Mesic	Ochric	Fluventic	Coarse-loamy	40-60	0	Well	3834asi 3834a 3834b
							0		
Recent alluvium	Alluvial bottoms	Mesic	Ochric/ eroded	Fluventic	Coarse-loamy	40-60	0	Well	3834ax 3834sa
Old alluvium	Fan	Mesic	Ochric	Argillic/ pan	Fine-loamy	20-40	0	Well	3835a 3835b
Old alluvium	Fan	Mesic	Ochric	Entic	Loamy-skeletal	40-60	0	Well	3837b
Recent alluvium	Alluvial bottoms	Mesic	Ochric	Salic	Fine-silty	40-60	0	Poorly	3838a
Old alluvium	Fan	Mesic	Ochric	Calcic	Coarse-loamy	40-60	0	Well	3839a 3839b
Vol. or Sed. rock	Upland	Mesic and frigid	C or R horizon	C or R horizon	Variable	0-10	35-75	Excessive	3840dc
Old alluvium	Term.ends of fans	Mesic and frigid	C or R horizon	C or R horizon	Variable	0-10	35-75	Excessive	3841deSS
Variable	Upper fans	Mesic and frigid	Variable	Variable	Variable	10-60	15-90	Well to excessive	3842bSS 3842cSS 3842dSS
Old alluvium	Fan	Mesic	Ochric	Cambic/ pan	Loamy-skeletal	10-20	15-35 35-75	Well	3850cS 3850dSS
Recent alluvium	Alluvial bottoms and terraces	Mesic	Ochric	Cambic	Coarse-loamy	40-60	0	Well	3851a 3851b 3851-3851a1
Old alluvium	Fan	Mesic	Ochric	Argillic/ pan	Loamy	10-20	0	Well	3852b
Old alluvium	Fan	Mesic	Ochric	Argillic/ pan	Loamy	10-20	15-35	Well	3852bs
Old alluvium	Fan	Mesic	Ochric	Cambic	Coarse-loamy	40-60	0	Well	3853a 3853b
Old alluvium	Fan	Mesic	Ochric	Argillic/ pan	Clayey	10-20	0	Well	3854b
Old alluvium	Fan	Mesic	Ochric	Argillic/ pan	Clayey	10-20	35-75	Well	3854bcSS
Old alluvium	Fan	Frigid	Ochric	Argillic/ pan	Loamy	10-20	0	Well	3856a 3856b
Old alluvium	Fan	Frigid	Ochric	Argillic/ pan	Loamy	10-20	15-35 35-75	Well	3856aS 3856bS 3856cdS
Old alluvium	Fan	Frigid	Ochric	Argillic/ pan	Clayey	10-20	0	Well	3857a
Old alluvium	Fan	Frigid	Ochric	Argillic/ pan	Clayey	10-20	15-35	Well	3857bS
Old alluvium	Fan	Frigid	Ochric	Cambic/ pan	Coarse-loamy	10-20	0	Well	3858a
Recent alluvial	Alluvial bottoms	Frigid	Ochric	Entic	Coarse-loamy	40-60	0	Well	3859a
Recent alluvium	Alluvial bottoms	Frigid	Ochric	Entic	Fine-loamy	40-60	0	Well	3860a
Old alluvium	Fan	Frigid	Ochric	Argillic	Fine-loamy	40-60	0	Well	3861a 3/
Recent alluvium	Alluvial bottoms	Frigid	Mollic	Cambic	Fine	40-60	0	Poorly	3862a
Recent alluvium	Alluvial bottoms	Frigid	Mollic/ eroded	Cambic	Fine	40-60	0	Poorly	3862ax

1/ Includes both cobble and stone size fragments.

2/ All complexes or associations except 3851a-3851a1 are omitted and should be keyed by individual components.

3/ Mapped only in complex 3856.

TABLE 3

CLASSIFICATION OF SOILS [1/]

Taxonomic Units	Series	Subgroup	Family
3853	Alcorn	Typic Camborthids	coarse-loamy, mixed, mesic
3860	Bereniston[2/]	Xeric Torriorthents	fine-loamy, mixed (calcareous), frigid
3837	Cliffdown	Typic Torriorthents	loamy-skeletal, mixed (calcareous), mesic
3835	Deerlodge	Xerollic Durargids	fine-loamy, mixed, mesic
3851	Dun Glen	Typic Camborthids	coarse-loamy, mixed, mesic
3834	Fang	Typic Torriorthents	coarse-loamy, mixed (calcareous), mesic
3862	Hutton[2/]	Typic Haplaquolls	fine, montmorillonitic, frigid
3854	Indian Creek	Xerollic Durargids	clayey, montmorillonitic, mesic shallow
3856	Olson	Xerollic Durargids	loamy, mixed, frigid, shallow
3839	Puddle	Typic Calciorthids	coarse-loamy, carbonatic, mesic
3857	Ratto	Xerollic Durargids	clayey, montmorillonitic, frigid, shallow
3838	Saltair	Typic Salorthids	fine-silty, mixed, mesic
3859	Shipley	Xeric Torriorthents	coarse-loamy, mixed (calcareous), frigid
3852	Spanel	Typic Durargids	loamy, mixed, mesic, shallow
3858	Unnamed	Haploxerollic Durorthids	loamy, mixed, frigid, shallow
3861	Unnamed	Xerollic Haplargids	fine-loamy, mixed, frigid
3850	Ursine	Xerollic Durorthids	loamy-skeletal, carbonatic, mesic, shallow
	Classification of Soils Associated with Miscellaneous Areas		
3840	------	Lithic Xeric Torriorthents or Lithic Xerollic Haplargids	loamy-skeletal, lithic
3841	------	Xeric Torriorthents	sandy-skeletal
3842	------	Xeric Torriorthents or Xerollic Camborthids	loamy-skeletal or sandy-skeletal

1/ Classifications are tentative pending final correlation. These classifications are based on a field correlation by E.A. Naphan, State Soil Scientist, USDA Soil Conservation Service, Reno, Nevada.

2/ Taxadjunct: The Bereniston series is a taxadjunct primarily due to ranging slightly outside the color value range and in its geographic setting. The Hutton series is a taxadjunct primarily due to the presence of lime and reaction.

INTERPRETATIONS

The following interpretive tables are presented on standard BLM forms, with only a few minor modifications. The criteria used to determine the individual soil ratings are found primarily in the BLM Manual 7312-Soils. In addition, USDA-SCS, 1971 was used as a supporting reference for certain interpretations.

The "Interim Guide for Rating Soils according to Their Suitability for Rangeland Seeding--Nevada" by James S. Hagihara, Carl M. Rice, Lucien N. Langan, 1972 was used to rate soil suitability for Range seeding in TABLE 8.

TABLE 10 was developed by Earth Environmental Consultants, Inc. The discussion and criteria for this table are presented as Appendix B.

The ratings used for suitability in these tables are good, fair, and poor, whereas limitations are rated as slight, moderate and severe.

TABLE 4

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.),	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class)
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (in.)			ANNUAL	EFFECT 1/	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3834a	Fang sl 0-3%	VD	MRAP	MED	WED	None		60	7-8	6-8	2.5-3.3	MOD	SLI	SLI	OCAL	8.0-9.0	SLI
3834asi	Fang sil gullied 0-3%	VD	MRAP	MED	WED	None		60	7-8	6-8	2.5-3.3	CRI	MOD	MOD	OCAL	8.0-9.0	SEV
3834ax	Fang fsl slightly saline, alkali eroded 0-3%	VD	MRAP	MED	WED	None		60	6-7	6-8	2.5-3.3	SEV	MOD	SLI	OCAL	8.4-9.0	SEV
3834b	Fang sl 3-8%	VD	MRAP	MED	WED	None		60	7-8	6-8	2.5-3.3	MOD	MOD	SLI	OCAL	8.0-9.0	SLI
3834sa	Fang fsl slightly saline alkali 0-3%	VD	MOD	MED	SPD	None		60	4-6	6-8	2.5-3.3	MOD	MOD	SLI	OCAL	8.4-9.0	SEV
3835a	Deerlodge gsl 0-3%	MD	MOD	MED	WED	DP	>6	20-30	4-5	6-8	2.5-3.3	SLI	SLI	SLI	None	7.8-9.0	MOD
3835b	Deerlodge gsl 3-8%	MD	MOD	MED	WED	DP	>6	20-30	4-5	6-8	2.5-3.3	MOD	MOD	SLI	None	7.8-9.0	MOD

1/ See page 79 for footnote.

TABLE 4 (Cont'd)

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.)	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class)
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (In.)			ANNUAL	EFFECT 1/	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3835-3834b	Deerlodge gls Fang sl 3-8%	Deerlodge part same as 3835b; Fang part same as 3834b.															
3835-3851a	Deerlodge-Dun Glen gsl 0 to 3%.	Deerlodge part same as 3835a; Dun Glen part same as 3851a.															
3835-3851-b	Deerlodge-Dun Glen gsl, 3 to 8%.	Deerlodge part same as 3835b; Dun Glen part same as 3851b.															
3835-3854-3834b	Deerlodge gsl-Indian Creek gls-Fang sl, 0 to 3%.	Deerlodge part same as 3835b; Indian Creek part same as 3854b; Fang part same as 3834b.															
3837b	Cliffdown gsl 3-8%	VD	MRAP	MED	SED	None	60	3-4	6-8	2.5-3.3	MOD	SLI	SLI	None	8.0-8.6	MOD	
3838a	Saltair sil 0-3% strongly saline	VD	SLOW	SLOW	POD	None	60	8-9	6-8	2.5-3.3	SLI	MOD	MOD	OCAL	8.2-9.6	SEV	
3839a	Puddle fsl 0-3%	VD	MOD	MED	WED	None	60	5-6	6-8	2.5-3.3	SLI	SLI	SLI	None	8.2-9.0	SEV	
3839b	Puddle gsl 3-8%	VD	MOD	MED	WED	None	60	5-6	6-8	2.5-3.3	MOD	MOD	SLI	None	8.2-9.0	MOD	
3840de	Rock & Shallow	VS	MOD	RAP	EXD	Rock	<20	1	6-12	2.5-6.0	SEV	SEV	SLI	None	7.0-8.5	SLI	

TABLE 4 (Cont'd)

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.)	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class)
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (in.)			ANNUAL	EFFECT 1/	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3841deSS	Very cobbly soils 15-60%	VD	MRAP	RAP	SED	None		60	3-4	6-12	2.5-6.0	SEV	SEV	SLI	None	7.6-8.5	SLI
3842bSS	Very stony soils,3-8%	VD	MOD	MED	WED	None		60	3-4	6-12	2.5-6.0	SLI	SLI	SLI	None	7.0-8.5	SLI
3842cSS	Very stony soils,8-15%	VD	MOD	RAP	SED	None		60	3-4	6-12	2.5-6.0	MOD	MOD	SLI	None	7.0-8.5	SLI
3842dSS	Very stony soils,15-60%	VD	MOD	RAP	SED	None		60	3-4	6-12	2.5-6.0	CRI	MOD	SLI	None	7.0-8.5	SLI
3850cS	Ursine cob. ls 8-15%	S	MOD	RAP	WED	DR	20	10-20	1	6-8	2.5-3.3	SEV	SEV	SLI	None	8.0-9.0	SLI
3850dSS	Ursine vst, ls 15-30%	S	MOD	RAP	WED	DR	20	10-20	1	6-8	2.5-3.3	CRI	SEV	SLI	None	8.0-9.0	SLI
3850-3851b	Ursine gsl-Dun Glen sl,3 to 8%	Ursine part same as 3850b; Dun Glen part same as 3851b.															
3851a	Dun Glen sl 0-3%	VD	MOD	MED	WED	None		60	7-8	6-8	2.5-3.3	SLI	SLI	SLI-MOD	None	7.8-9.0	SEV

1/ See page 79 for footnote.

TABLE 4 (Cont'd)

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.)	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (in.)			ANNUAL	EFFECT 1/	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3851b	Dun Glen sl 3-8%	VD	MOD	MED	WED	None		60	7-8	6-8	2.5-3.3	MOD	MOD	SLI	None	7.8-9.0	MOD
3851-3851al	Dun Glen soils 0-3%	Dun Glen sl part same as 3851a; Dun Glen silt loam part follows.															
	Dun Glen sil, 0-3%	VD	MOD	MED	WED	None		60	7-8	6-8	2.5-3.3	SLI	SLI	MOD	None	7.8-9.0	sev
3852b	Spanel gsl 3-8%	S	MOD	MED	WED	DP	>6	10-20	2-3	6-8	2.5-3.3	MOD	MOD	SLI	None	8.2-9.0	MOD
3852bS	Spanel st gsl 3-8%	S	MOD	MED	WED	DP	>6	10-20	2-3	6-8	2.5-3.3	MOD	MOD	SLI	None	8.2-9.0	MOD
3853a	Alcorn ls 3-8%	VD	MRAP	SLOW	WED	None		60	5-7	6-8	2.5-3.3	SLI	SLI	SLI	None	7.4-8.5	SLI
3853b	Alcorn ls 3-8%	VD	MRAP	SLOW	WED	None		60	5-7	6-8	2.5-3.3	SLI	SLI	SLI	None	7.4-8.5	SLI
3854b	Indian Creek gsl 3-8%	S	SLOW	MED	WED	DP	>6	10-20	2-3	6-8	2.5-3.3	MOD	MOD	SLI	None	7.6-9.0	SLI
3854bcSS	Indian Creek, v cob ls 3-15%	S	SLOW	MED-RAP	WED	DP	>6	10-20	2-3	6-8	2.5-3.3	MOD	MOD	SLI	None	7.6-9.0	SLI

TABLE 4 (Cont'd)

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.)	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class)
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (in.)			ANNUAL	EFFECT 1/	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3854-3853b	Indian Creek-Alcorn gls, 3 to 8%, Indian Creek part is same as 3854b; Alcorn part is same as 3853b.																
3856a	Olson gsl 0-3%	S	MOD	MED	WED	DP	>6	10-20	2-3	8-10	4-5	SLI	SLI	SLI	None	7.6-9.0	MOD
3856a	Olson cob sl 0-3%	S	MOD	MED	WED	DP	>6	10-20	2-3	8-10	4-5	SLI	SLI	SLI	None	7.6-9.0	MOD
3856b	Olson gsl 3-8%	S	MOD	MED	WED	DP	>6	10-20	2-3	8-10	4-5	MOD	MOD	SLI	None	7.6-9.0	MOD
3856bS	Olson cob sl 3-8%	S	MOD	MED	WED	DP	>6	10-20	2-3	8-10	4-5	MOD	MOD	SLI	None	7.6-9.0	MOD
3856cdS	Olson cob sl 8-30%	S	MOD	RAP	SED	DP	>6	10-20	2-3	8-10	4-5	CRI	SEV	SLI	None	7.6-9.0	MOD
3856-3858a	Olson-Haploxerollic-Durorthid gsl, 0-3%; Olson part is the same as 3856a; Haploxerollic Durorthid part is the same as 3858a.																
3856-3858b	Olson-Haploxerollic Durorthid gsl, 3 to 8%; Olson part is the same as 3856b. Haploxerollic Durorthid part only	VD	MOD	MED	WED	None		60	6-7	8-10	4-5	MOD	MOD	SLI	None	7.6-9.0	MOD
3856-3861bS	Olson-Xerollic Haplargid cob sl, 3 to 8%; Olson part is same as 3856bS. Xerollic Haplargid cob sl part only	VD	MOD	MED	WED	None		60	7-10	8-10	4-5	MOD	MOD	SLI	None	7.6-9.0	

1/ See page 79 for footnote.

TABLE 4 (Cont'd)

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.)	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class)
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (in.)			ANNUAL	EFFECT	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3857a	Ratto gsl 0-3%	S	SLOW	MED	WED	DP	>6	10-20	2-3	8-10	4-5	SLI	SLI	SLI	None	7.6-9.0	MOD
3857bS	Ratto st gsl 3-8%	S	SLOW	MED	WED	DP	>6	10-20	2-3	8-10	4-5	MOD	MOD	SLI	None	7.6-9.0	MOD
3858a	Haplo-Xerollic Durorthid gsl 0-3%	VD	MOD	SLOW	WED	None		60	6-7	8-10	4-5	SLI	SLI	SLI	None	7.6-9.0	MOD
3858-3859a	Haplo-xerollic Durorthid-Shipley gsl, 0-3%: Haploxerollic Durorthid part is the same as 3858a; Shipley part is same as 3859a																
3858-3859-3860a	Haploxerollic Durorthid-Shipley gsl-Bereniston sil, saline-alkali 0-3%; Haploxerollic Durorthid part is same as 3858a; Bereniston part is same as the Bereniston part of the 3859-3860a map unit.																
3859a	Shipley gsl 0-3%	VD	MOD	SLOW	WED	None		60	7-8	8-10	4-5	SLI	SLI	SLI	OCAL	7.6-9.0	MOD
3859-3860a	Shipley gsl-Bereniston sil, saline-alkali, 0-3%.																
	Shipley gsl part only	VD	MOD	SLOW	MWD	None		60	4-6	8-10	4-5	SLI	MOD	SLI	SEAL	8.2-9.0	MOD
	Bereniston sil saline-alkali part only	VD	MOD	SLOW	MWD	None		60	7-8	8-10	4-5	SLI	MOD	MOD	SEAL	8.2-9.0	SEV

1/ See page 79 for footnote.

TABLE 4 (Cont'd)

INTERPRETIVE RATINGS FOR SELECTED SOIL PROPERTIES AND QUALITIES

MAP SYMBOL	SOIL NAME	CLASS				LIMITING LAYER		EFFECTIVE ROOTING DEPTH (in.)	AVAILABLE WATER CAPACITY (in.)	PRECIPITATION (in.)		EROSION		COMPACTION HAZARD (Class)	FREQUENCY OF FLOODING	REACTION RANGE (pH)	FROST SUSCEPTIBILITY (Class)
		DEPTH	PERMEABILITY	RUNOFF	DRAINAGE	KIND	THICKNESS (in.)			ANNUAL	EFFECT	CONDITION	SUSCEPTIBILITY (Class)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3860a	Bereniston sil 0-3%	VD	MOD	SLOW	WED	None		60	11-13	8-10	4-5	SLI	SLI	MOD	OCAL	7.6-9.0	SEV
3861-3856a	Xerollic Haplargid-Olson Xerollic Haplargid part only	sl, 0-3%; Olson part is the same as 3856a map unit.															
		VD	MOD	MED	WED	None		60	7-10	8-10	4-5	SLI	SLI	SLI	None	7.6-9.0	MOD
3862a	Hutton sicl 0-3%	VD	SLOW	SLOW	POD	None		60	9-10	8-10	4-5	SLI	SLI	MOD-SEV	SEAL	8-0-9.0	SEV
3862ax	Hutton sicl saline-alkali, eroded, 0-3%	VD	SLOW	SLOW	POD	None		60	6-7	8-10	4-5	SEV	SEV	MOD-SEV	SEAL	8.0-9.0	SEV

1/ Due to lack of detailed rainfall data, the effective precipitation was computed as 1/3 the winter precipitation plus 1/2 the summer precipitation for mesic areas, and 1/2 winter precipitation plus 1/2 summer precipitation for frigid areas.

TABLE 5

ENGINEERING PROPERTIES OF SOILS
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	DEPTH FROM SURFACE OF TYPICAL PROFILE (inches)	DEPTH TO		HYDROLOGIC SOIL GROUP	SHRINK-SWELL POTENTIAL	CORROSIVITY		CLASSIFICATION			COARSE FRACTION
			BEDROCK or Duripan	SEASONAL HIGH WATER TABLE (Inches)			UNCOATED STEEL	CONCRETE	USDA TEXT.	UNIFIED	AASHO	(percent)
(1)	(2)	(3)	(4)	(5)	(6) 1/	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3834a	Fang sl	0 - 40	> 60	> 60	(B) A	Low	Low	Low	sl	SM	A-2-4	15-35
3834asi	Fang sil gullied	0 - 4 4 - 40	> 60	> 60	B	Low	Low	Low	sil sl	ML SM	A - 4 A-2-4	0-15 15-25
3834ax	Fang fsl slightly saline-alkali eroded	0 - 4 4 - 40	> 60	> 60	B	Low	High	Low	fsl sl	SM SM	A-4 A-2-4	0-15 15-25
3834b	Fang sl	0 - 40	> 60	> 60	B	Low	Low	Low	sl	SM	A-2-4	15-25
3834sa	Fang fsl strongly saline-alkali	0 - 4 4 - 40	> 60	> 60	(B) A	Low	V High	Low	fsl sl	SM SM	A-4 A-2-4	0-15 15-25
3835a 3835b	Deerlodge gsl	0 - 4 4 - 24	20-40	> 60	(C) B	Low Mod	Low	Low	gsl scl	SM SC	A-2-4 A-2-6	15-35 0-35
3835-3834	Deerlodge-Fang gravelly sandy loams; Deerlodge part is the same as 3835b; Fang part is the same as 3834b.											
3835-3851a	Deerlodge-Dun Glen gravelly sandy loams; Deerlodge part is the same as 3835a; Dun Glen part is the same as 3851a.											
3835-3851b	Deerlodge-Dun Glen gravelly sandy loams; Deerlodge part is the same as 3835b; Dun Glen part is the same as 3851b.											

1/ See page 85 for footnote.

TABLE 5 (Cont'd)

ENGINEERING PROPERTIES OF SOILS
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	DEPTH FROM SURFACE OF TYPICAL PROFILE (inches)	DEPTH TO		HYDROLOGIC SOIL GROUP 1/	SHRINK-SWELL POTENTIAL	CORROSIVITY		CLASSIFICATION			COARSE FRACTION (percent)
			BEDROCK	SEASONAL HIGH WATER TABLE (Inches)			UNCOATED STEEL	CONCRETE	USDA TEXT.	UNIFIED	AASHO	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3835-3854-3834b	Deerlodge gravelly sandy loam-Indian Creek gravelly loamy sand-Fang sandy loam; Deerlodge part is the same as 3835b; Indian Creek part is the same as 3854b; Fang part is the same as 3834b.											
3837b	Cliffdown gsl	0 - 18 18 - 40	> 60	> 60	B	Low V Low	Low	Low	gsl vgsl	SM GM	A-2-4 A-1	15-35 55-85
3838a	Saltair sil strongly saline	0 - 12 12 - 48	> 60	20-40	A	Low High	V High	Low	sil sicl	ML CL	A-4 A-7	0-15 0-15
3839a	Puddle fsl	0 - 17 17 - 40	> 60	> 60	(D) B	Low	Mod	Low	fsl gl	SM ML	A-2-4 A-4	0-15 15-35
3839b	Puddle gsl	0 - 17 17 - 40	> 60	> 60	(D) B	Low	Mod	Low	gsl gl	SM ML	A-2-4 A-4	15-35 15-35
3840de	Rock and shallow soils	----	0-20	> 60	D	---	---	---	---	--	----	----
3841deSS	Very cobbly soils	0 - 40	> 60	> 60	D	Low	Low	Low	v cob sl	GM	A-1	55-95
3842bSS	Very stony soils	0 - 40	> 60	> 60	(D) B	Low	Low	Low	v st sl	GM	A-1	55-95
3842cSS	Very stony soils	0 - 40	> 60	> 60	(D) C	Low	Low	Low	v st sl	GM	A-1	55-95
3842dSS	Very stony soils	0 - 40	> 60	> 60	D	Low	Low	Low	v st sl	GM	A-1	55-95
3850b	Ursine gsl	0 - 4 4 - 14	10-20	> 60	(D) C	Low	Mod	Low	gsl vgsl	SM GM	A-2-4 A-1	15-25 55-85

1/ See page 85 for footnote.

TABLE 5 (Cont'd)

ENGINEERING PROPERTIES OF SOILS
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	DEPTH FROM SURFACE OF TYPICAL PROFILE (inches)	DEPTH TO		HYDROLOGIC SOIL GROUP 1/	SHRINK-SWELL POTENTIAL	CORROSIVITY		CLASSIFICATION			COARSE FRACTION (percent)
			BEDROCK	SEASONAL HIGH WATER TABLE (inches)			UNCOATED STEEL	CONCRETE	USDA TEXT.	UNIFIED	AASHO	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3850cS	Ursine cob ls	0 - 4 4 - 14	10-20	> 60	(D) C	Low	Mod	Low	gls vgls	SM GM	A-2-4 A-1	15-25 55-85
3850dSS	Ursine	0 - 4 4 - 14	10-20	> 60	D	Low	Mod	Low	vst ls vgsl	GM GM	A-1 A-1	35-55 55-85
3850-3851b	Ursine gsl - Dun Glen sl; Ursine part is the same as 3850b; Dun Glen part is the same as 3851b.											
3851a	Dun Glen sl	0 - 40	> 60	> 60	(B) A	Low	Low	Low	sl	SM	A-2-4	0-35
3851b	Dun Glen sl	0 - 40	> 60	> 60	B	Low	Low	Low	sl	SM	A-2-4	0-25
3851-3851a1	Dun Glen soils. The Dun Glen sl is the same as 3851a; the Dun Glen sil part follows.											
	Dun Glen sil	0 - 4	> 60	60	(B) A	Low	Low	Low	sil	ML	A-4	0-15
		4 - 40	> 60	60	(B) A	Low	Low	Low	sl	SM	A-2-4	15-35
3852b 3852bS	Spanel gsl	0 - 4 4 - 12	10-20	> 60	(D) C	Low Mod	Low	Low	gsl gscl	SM SC	A-2-4 A-6	15-35 15-35
3853a	Alcorn ls	0 - 8 8 - 34 34 - 60	> 60	> 60	A	Low	Low	Low	ls sl ls	SM SM SM	A-2-4 A-2-4 A-2-4	15-35 15-35 15-35

1/ See page 85 for footnote.

TABLE 5 (Cont'd)

ENGINEERING PROPERTIES OF SOILS
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	DEPTH FROM SURFACE OF TYPICAL PROFILE (inches)	DEPTH TO		HYDROLOGIC SOIL GROUP 1/	SHRINK-SWELL POTENTIAL	CORROSIVITY		CLASSIFICATION			COARSE FRACTION (percent)
			BEDROCK	SEASONAL HIGH WATER TABLE (inches)			UNCOATED STEEL	CONCRETE	USDA TEXT.	UNIFIED	AASHO	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3854b	Indian Creek gls	0 - 4 4 - 12	10-20	>60	B	Low High	Mod	Low	gls sc	SM CL	A-2-4 A-7	15-35 0-15
3854bcSS	Indian Creek vcob ls	0 - 4 4 - 12	10-20	>60	C	Low High	Mod	Low	vcob ls sc	SM CL	A-2-4 A-7	35-55 0-15
3854-3853b	Indian Creek-Alcorn gls: The Indian Creek part is the same as 3854b. The Alcorn is the same as 3853b.											
3856a 3856b	Olson gsl	0 - 4 4 - 16	10-20	>60	(D) C	Low Mod	Low	Low	gsl scl	SM SC	A-2-4 A-6	15-35 0-15
3856aS 3856bS	Olson cob sl	0 - 4 4 - 16	10-20	>60	(D) C	Low Mod	Low	Low	cob sl scl	SM SC	A-2-4 A-6	15-35 0-15
3856cds	Olson cob sl	0 - 4 4 - 16	10-20	>60	D	Low Mod	Low	Low	cob sl scl	SM SC	A-2-4 A-6	15-35 0-15
3856-3858a	Olson-Haplo-Xerollic Durorthid gsl	The Olson part is the same as 3856a. The Haploxerollic Durorthid part is the same as 3858a										
3856-3858b	Olson-Haploxerollic Durorthid gsl. The Olson part is the same as 3856b.											
	Haploxerollic Durorthid gsl part only	0 - 40	> 60	> 60	B	Low	Mod	Low	gsl	SM	A-2-4	15-35

1/ See page 85 for footnote.

TABLE 5 (Cont'd)

ENGINEERING PROPERTIES OF SOILS
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	DEPTH FROM SURFACE OF TYPICAL PROFILE (inches)	DEPTH TO		HYDRO-LOGIC SOIL GROUP 1/	SHRINK-SWELL POTEN-TIAL	CORROSIVITY		CLASSIFICATION			COARSE FRAC-TION (percent)
			BED-ROCK	SEASONAL HIGH WATER TABLE (Inches)			UNCOATED STEEL	CON-CRETE	USDA TEXT.	UNIFIED	AASHO	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3856-3861bs	Olson-Xerollic Haplargid cob sl. The Olson is the same as 3856bS.											
	Xerollic Haplargid cob sl part only	0 - 4 4 - 22 22 - 29 24 - 40	> 60	> 60	B	Low Mod V Low Low	Low	Low	cob sl scl vgsl sil	SM SC GM ML	A-2-4 A-6 A-1 A-4	15-35 0-15 35-55 0-15
3857a	Ratto gsl	0 - 4 4 - 14	10-20	> 60	(D) B	Low High	Low Mod	Low	gsl sc	SM CL	A-2-4 A-7	15-35 0-15
3857bs	Ratto st gsl	0 - 4 4 - 14	10-20	> 60	(D) C	Low High	Low Mod	Low	st gsl sc	SM CL	A-2-4 A-7	15-35 0-15
3858a	Haploxerollic Durorthid gsl	0 - 40	> 60	> 60	(B) A	Low	Mod	Low	gsl	SM	A-2-4	15-35
3858-3859a	Haploxerollic Durorthid-Shipley gsl. The Haploxerollic Durorthid part is the same as 3858a. The Shipley part is the same as 3859a.											
3858-3859-3860a	Haploxerollic Durorthid-Shipley gsl-Bereniston sil. The Haploxerollic Durorthid is the same as 3858a. The Shipley part is the same as the Shipley part of the 3859-3860a map unit. The Bereniston part is the same as 3859-3860a map unit.											

1/ See page 85 for footnote.

TABLE 5 (Cont'd)

ENGINEERING PROPERTIES OF SOILS
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	DEPTH FROM SURFACE OF TYPICAL PROFILE (inches)	DEPTH TO		HYDRO-LOGIC SOIL GROUP	SHRINK-SWELL POTEN-TIAL	CORROSIVITY		CLASSIFICATION			COARSE FRAC-TION (percent)
			BED-ROCK	SEASONAL HIGH WATER TABLE (inches)			UNCOATED STEEL	CON-CRETE	USDA TEXT.	UNIFIED	AASHO	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3859a	Shipley gsl	0 - 40	> 60	> 60	A	Low	Low	Low	gsl	SM	A-2-4	15-35
3859-3860a	Shipley gsl saline-alkali-	0 - 40	> 60	> 60	A	Low	Mod	Low	gsl	SM	A-2-4	15-35
	Bereniston sil saline-alkali	0 - 40	> 60	> 60	A	Low	Mod	Low	sil	ML	A-4	0-35
3860a	Bereniston sil	0 - 40	> 60	> 60	A	Low	Low	Low	sil	ML	A-4	0-35
3861-3856a	Unnamed Haplargid sl	0 - 4	> 60	> 60	B	Low	Low	Low	sl	SM	A-2-4	15-35
		4 - 22				Mod			scl	SC	A-6	0-15
		22 - 29				V Low			vgsl	GM	A-1	35-55
		29 - 40				Low			sil	ML	A-4	0-15
	Olson sl. The Olson part is the same as 3856a.											
3862a	Hutton sicl	0 - 7	> 60	20-40	B	High	High	Low	sicl	CL	A-7	0-15
		7 - 60				V High			sic	CH	A-7	0-15
3862ax	Hutton sicl saline-alkali, eroded	0 - 7	> 60	10-40	B	High	V High	Low	sicl	CL	A-7	0-15
		7 - 60				V High			sic	CH	A-7	0-15

1/ Letters in parenthesis represent SCS reviewers placement.

TABLE 6

INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS		ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	AREAS			PATHS/ TRAILS	SEPTIC TANK ABSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
		DRYLAND FARMING 1/	IRRIGATION	TOPSOIL	SAND/ GRAVEL	ROAD FILL	LOCATION	EMBANKMENT				CAMP	PICNIC	PLAY						
3834a 3834asi 3834b	Fang sl		Good	Good	Poor SM	Good	Mod: SM	Mod: SM	Mod: flooding	Sev: flooding	Sev: flooding	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: flooding	Mod: Perm.	Sev: flooding	Sev: flooding	Slight
3834ax	Fang fsl slightly saline-alkali, eroded		Poor saline-alkali	Fair saline-alkali	Poor SM	Good	Mod: SM	Mod: SM	Mod: flooding	Sev: flooding	Sev: flooding	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: flooding	Mod: Perm.	Sev. flooding	Sev: flooding	Mod: pH
3834sa	Fang fsl strongly saline-alkali eroded		Poor saline-alkali	Poor saline-alkali	Poor SM	Good	Mod: SM	Mod: SM	Mod: flooding	Sev: flooding	Sev: flooding	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: flooding	Mod: Perm	Sev: flooding	Sev: flooding	Sev: pH salinity
3835a	Deerlodge gsl		Fair soil depth	Fair coarse fragments	Poor SM & SC	Good	Sev: depth	Slight	Mod: depth	Sev: depth	Mod: depth	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: depth	Sev: depth	Mod: Duri-pan	Mod: depth	Mod: depth
3835b	Deerlodge gsl		Fair-Poor depth-slope	Fair coarse fragments	Poor SM SC	Good	Sev: depth	Slight	Mod: depth	Sev: depth	Mod: depth	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Sev: depth	Sev: depths	Mod: Duri-pan	Mod: depth slope	Mod: depth
3835-3834b	Deerlodge-Fang gsl; Deerlodge part is the same as 3835b, Fang part is the same as 3834b.																			

1/For all dryland farming, all units are poor due to low rainfall climate.

TABLE 6 (Cont'd)

INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS		ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	AREAS			PATHS/ TRAILS	SEPTIC TANK ADSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
		DRYLAND FARMING 1/	IRRIGATION	TOPSOIL	SAND/ GRAVEL	ROAD FILL	LOCATION	EMBANKMENT				CAMP	PICNIC	PLAY						
3835-3851a	Deerlodge-Dun Glen gsl; Deerlodge part is the same as Dun Glen part is the same as 3851a.						3835a;													
3835-3851b	Deerlodge-Dun Glen gsl; Deerlodge part is the same as Dun Glen part is the same as 3851b.						3835b													
3835-3854-3834b	Deerlodge gsl-Indian Creek gls-Fang sl; Deerlodge part is the same as 3835b; Indian Creek part is the same as 3854b; Fang part is the same as 3834b.																			
3837b	Cliff-down gsl		Fair-AWC	Poor Coarse fragments	Fair below 18"	Good	Sev. perm.	Mod-Sev: perm.	Slight	Slight Mod. gravel	Slight	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Slight	Sev: perm.	Sev: perm.	Mod: slope	Mod: AWC
3838a	Saltair sil		Poor saline-alkali	Poor saline-alkali	Poor CL	Poor CL	Slight	Mod: ML	Sev: flood-ing	Sev: flood-ing	Sev: flood-ing	Sev: wet-ness	Mod: dusty	Mod: dusty	Slight	Sev: water table	Sev: water table	Sev: water table	Sev: saline	Sev: pH salin-ity
3839a	Puddle fsl		Fair AWC high lime	Fair-Poor gravel high lime	Poor SM	Good	Mod: SM	Mod: SM	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Slight	Mod: perm.	Slight	Slight	Mod: pH
3839b	Puddle gsl		Fair AWC high lime slope	Fair-Poor gravel high lime	Poor SM	Good	Mod:SM	Mod:SM	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Slight	Mod: perm. slope	Slight	Mod: slope	Mod: pH
3840de	Rock and shallow soils		unsuited rock outcrop	unsuited rock outcrop	unsuited	unsuited	Sev: depth	Sev: rock	Sev: slope-rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: rock	Sev: AWC

1/ For all dryland farming, all units are poor due to low rainfall climate.

TABLE 6 (Cont'd)

INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS					AREAS								
		DRYLAND FARMING 1/	IRRIGATION	TOPSOIL	SAND/GRAVEL	ROAD FILL	LOCATION	EMBANKMENT	ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	CAMP	PICNIC	PLAY	PATHS/TRAILS	SEPTIC TANK ADSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
3841deSS	Very cobbly soils		unsuited slope cobbles	unsuited slope cobbles	Poor GM	Poor slope	Sev: slope	Sev: perm.	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Sev: slope	Mod: AWC
3842bSS	Very stony soils		unsuited stones	unsuited stones	unsuited	Poor stones	Mod: perm.	Sev: perm.	Sev. stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Slight	Sev: stones	Sev: stones	Sev: stones	Mod: AWC
3842cSS	Very stony soils		unsuited stones	unsuited stone	unsuited	Poor stones	Mod: perm.	Sev: perm.	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Mod: slope	Sev: stones	Sev: stones	Sev: stones	Sev: stones
3842dSS	Very stony soils		unsuited stones	unsuited stones	unsuited	Poor stones slope	Sev: slope	Sev: perm.	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: stones	Sev: slope	Sev: stones	Sev: slope	Sev: slope	Mod: AWC
3850cS	Ursine cob ls		Poor depth slope	Poor-gravel	Poor SM	Good	Sev. depth	Mod: SM	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Sev: slope	Slight	Sev: depth	Sev: depth slope	Mod: Duripan	Sev: depth	Sev: depth
3850dSS	Ursine vst ls		Poor depth stones-slope	Poor-gravel stones	Poor GM	Good	Sev: depth	Mod: GM	Sev: depth	Sev: depth	Sev: depth	Sev: stones	Sev: stones	Sev: slope stones	Sev: stones	Sev: depth	Sev: depth slope	Sev: stones slope	Sev: depth	Sev: depth
3850-3851b	Ursine gsl-Dun Glen sl. Ursine part is the same as 3850b Dun Glen part is the same as 3851b																			
3851a	Dun Glen sl		Good	Good	Poor SM	Good	Mod: SM	Mod: SM	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Slight	Mod: Perm.	Slight	Slight	Slight

1/ For all dryland farming, all units are poor due to low rainfall climate.

TABLE 6 (Cont'd)

INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS					AREAS								
		DRYLAND FARMING 1/	IRRIGATION	TOPSOIL	SAND/ GRAVEL	ROAD FILL	LOCATION	EMBANKMENT	ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	CAMP	PICNIC	PLAY	PATHS/ TRAILS	SEPTIC TANK ABSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
3851b	Dun Glen sl		Good-Fair slope	Good	Poor SM	Good	Mod: SM	Mod: SM	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Slight	Mod: perm.	Slight	Mod: slope	Slight
3851-3851al	Dun Glen soils. The Dun Glen sl part is the same as 3851a The Dun Glen sil part follows:																			
			Good	Good	Poor SM	Good	Mod: SM	Mod: SM	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Slight	Mod: perm.	Slight	Slight	Slight
3852b 3852bS	Spanel gsl		Poor-depth	Poor-gravel	Poor SM SC	Fair SC	Sev: depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev: depth
3853a	Alcorn ls		Fair-texture	Poor-texture	Poor SM	Good	Sev: perm.	Mod: SM	Slight	Mod: Sev sl	Slight	Mod: sandy	Mod: dusty	Mod: dusty	Slight	Slight	Sev: perm.	Sev: perm.	Mod: texture	Slight
3853b	Alcorn ls		Fair-texture slope	Poor-texture	Poor SM	Good	Sev: perm.	Mod: SM	Slight	Mod: Sev sl	Slight	Mod: sandy	Mod: dusty	Mod: dusty slope	Slight	Slight	Sev: perm.	Sev: perm.	Mod: texture	Slight
3854b	Indian Creek gls		Poor-depth	Poor-gravel	Poor SM	Poor CL	Sev: depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod. dusty	Mod: dusty	Mod: dusty slope	Slight	Sev: depth	Sev: depth	Sev: Duripan	Sev: depth	Sev: depth
3854bcSS	Indian Creek v cob sl		Poor-depth slope-stones	Poor-cobble	Poor GM	Poor CL	Sev: depth	Mod: GM	Sev: depth slope	Sev: depth	Sev: depth slope	Sev: stones	Sev: stones	Sev: slope stones	Sev: cobbles	Sev: depth	Sev: depth slopes	Sev: stones	Sev: depth cobbles	Sev: depth

1/ For all dryland farming, all units are poor due to low rainfall climate.

TABLE 6 (Cont'd)

INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS					AREAS								
		DRYLAND FARMING 1/	IRRIGATION	TOPSOIL	SAND/ GRAVEL	ROAD FILL	LOCATION	EMBANKMENT	ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	CAMP	PICNIC	PLAY	PATHS/ TRAILS	SEPTIC TANK ABSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
3854-3853b	Indian Creek-Alcorn gls; Indian Creek part is the same as 3854b; Alcorn part is the same as 3853b.																			
3856a	Olson gsl		Poor-depth	Fair-gravel	Poor SM SC	Good	Sev: depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev. depth
3856aS	Olson cob sl		Poor-depth	Poor-cobble	Poor SM SC	Good	Sev: depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev: depth
3856b	Olson gsl		Poor-depth	Fair-depth gravel	Poor SM SC	Good	Sev: depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev: depth
3856bS	Olson cob sl		Poor-depth	Poor-cobble	Poor SM SC	Good	Sev. depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev: depth
3856cdS	Olson cob sl		Poor-depth	Poor-cobble	Poor SM SC	Good-Fair slope	Sev: depth slope	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty slope	Mod: dusty slope	Mod: dusty slope cobbles	Mod: slope	Sev: depth	Sev: depth slope	Mod: Duripan	Sev: depth slope	Sev: depth
3856-3858a	Olson-Haploxerollic Durorthid gsl. The Olson part is the same as 3856a. The Haploxerollic Durorthid part is the same as 3858a.																			

1/ For all dryland farming, all units are poor due to low rainfall climate.

TABLE 6 (Cont'd)

INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS					AREAS								
		DRYLAND FARMING	IRRIGATION	TOPSOIL	SAND/GRAVEL	ROAD FILL	LOCATION	EMBANKMENT	ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	CAMP	PICNIC	PLAY	PATHS/TRAILS	SEPTIC TANK ADSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
3856-3858b	Olson-Haploxerollic Haploxerollic Durorthid gsl part only	1/	Durorthid gsl. Good-Fair Slope	Good	Olson part is the same as 3856b. Poor SM	Good	Mod: SM	Slight Mod:SM SC	Slight	Mod: sl	Slight	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Slight	Mod: perm.	Slight	Mod: slope	Slight
3856-3861bS	Olson-Xerollic Haplargid cob sl part only		Haplargid cob sl. Fair-slope cobbles	Fair-cobbles	Olson part is the same as 3856bS. Poor SM SC	Good	Mod. perm.	Slight Mod: SM SC	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Slight	Mod: perm.	Slight	Mod: slope	Slight
3857a	Ratto gsl		Poor-depth	Poor-gravel	Poor-SM SC	Poor CL	Sev: depth	Slight	Sev: depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev: depth
3857bS	Ratto st gsl		Poor-depth	Poor-stones	Poor-SM SC	Poor CL	Sev. depth	Slight	Sev. depth	Sev: depth	Sev: depth	Mod: dusty	Mod: dusty	Mod: dusty slope	Slight	Sev: depth	Sev: depth	Mod: Duripan	Sev: depth	Sev: depth
3858a	Haploxerollic Durorthid gsl		Good	Good	Poor SM	Good	Mod: SM	Mod: SM	Slight	Mod: sl	Slight	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Slight	Mod: perm.	Slight	Slight	Slight
3858-3859a	Haploxerollic Durorthid-Shipley gsl.		The Haploxerollic Durorthid part is the same as 3858a. The Shipley part is the same as 3859a.																	
3858-3859-3860a	Haploxerollic-Durorthid-Shipley gsl-Bereniston sil, saline-alkali. part of 3859-3860a map unit; the Bereniston is the same as the		The Haploxerollic Durorthid is the same as 3858; Shipley part is the same as the Shipley Bereniston part of the 3859-3860a map unit.																	
3859a	Shipley gsl		Good	Good	Poor SM	Good	Mod. SM	Mod. SM	Mod. flood-ing	Sev. flood-ing	Sev. flood-ing	Mod. dusty	Mod. dusty	Mod. dusty	Slight	Sev. flood-ing	Mod. Perm.	Sev. flood-ing	Sev. flood-ing	Slight

1/ For all dryland farming, all units are poor due to low rainfall climate.

TABLE 6 (Cont'd)
INTERPRETIVE RATINGS FOR SOIL USES

MAP SYMBOL	SOIL NAME	SUITABILITY					DEGREE OF LIMITATION AND SOIL FEATURES AFFECTING													
							PONDS					AREAS								
		DRYLAND FARMING 1/	IRRIGATION	TOPSOIL	SAND/ GRAVEL	ROAD FILL	LOCATION	EMBANKMENT	ROAD LOCATION	SHALLOW EXCAVATIONS	BUILDING SITES	CAMP	PICNIC	PLAY	PATHS/ TRAILS	SEPTIC TANK ABSORPTION	SEWAGE LAGOONS	SANITARY LANDFILL (trench)	LAWNS AND GOLF FAIRWAYS	LANDSCAPE PLANTINGS
3859-3860a	Shipley gsl-Bereniston sil, Shipley gsl saline-alkali part		Fair-Poor saline-alkali	saline-alkali Fair saline-alkali	Poor SM	Good	Mod. SM	Mod. SM	Mod. flooding	Mod. flooding	Sev. flooding	Mod. dusty	Mod. dusty	Mod. dusty	Slight	Sev. flooding	Mod. Perm.	Sev. flooding	Sev. flooding	Slight
	Bereniston sil saline-alkali part		Fair-Poor Saline-Alkali	Fair saline-alkali	Poor ML	Fair ML	Mod. ML	Mod. ML	Mod. flooding	Mod. flooding	Sev. flooding	Mod. dusty	Mod. dusty	Mod. dusty	Slight	Sev. flooding	Mod. perm.	Sev. flooding	Sev. flooding	Mod. pH salinity
3860a	Bereniston sil		Good	Good	Poor ML	Fair ML	Mod: ML	Mod: ML	Mod: flooding	Mod: flooding	Sev: flooding	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Sev: flooding	Mod: perm.	Sev: flooding	Sev: flooding	Slight
3861-3856a	Xerollic Haplargid sl part		Good	Good	Poor SM SC	Good	Mod: perm.	Slight-Mod: SM SC	Slight	Slight	Slight	Mod: dusty	Mod: dusty	Mod: dusty	Slight	Slight	Mod: perm.	Slight	Slight	Slight
	Olson sl part is the same as the 3856a																			
3862a	Hutton sicl		Fair clay subsoil	Fair texture	Poor CL CH	Poor CH	Slight	Slight	Sev: CH flooding	Sev: flooding	Sev: flooding	Sev: clayey	Mod: wetness	Sev: flooding	Sev: clayey	Sev: perm. flooding	Sev: water table	Sev: water table	Sev: flooding	Slight
3862ax	Hutton sicl saline-alkali, eroded		Fair slow perm. saline-alkali	Poor saline-alkali	Poor CL CH	Poor CH	Slight	Slight	Sev: CH flooding	Sev: flooding	Sev: flooding	Sev: clayey	Mod: wetness	Sev: flooding	Sev: clayey	Sev: perm. flooding	Sev: water table	Sev: water table	Sev: flooding	Mod: pH salinity

1/ For all dryland farming, all units are poor due to low rainfall climate.

TABLE 7

RANGE MANAGEMENT 1/
MEASUREMENTS AND INTERPRETATIONS

RANGE SITE AND MAP SYMBOL 2/	KEY VEGETATIVE SPECIES (Potential)		PRODUCTIVE CAPACITY		REMARKS
	HERBACEOUS	WOODY	TOTAL POUNDS PER ACRE 3/	ACRES PER AUM	
Desert loamy fan (NV-28-1) 3834 asi, 3854b, 3854c, 3854bcSS, 3854dSS, 3854-3853b (3854 part only)	Indian ricegrass	Winterfat Big sagebrush	A 150 B 400		
Desert saline bottom (NV-28-4) 3862ax	Saltgrass	Greasewood	A 500 B1200		
Loamy bottom (NV-28-6) 3834a, 3834b, 3835-3834b (3834b part only) 3835-3854-3834b (3834b part only)	Basin wildrye Indian ricegrass	Big sagebrush Rubber rabbitbrush Greasewood	A 250 B 500		
Wet meadow (NV-28-9) 3862a	Saltgrass Sedges		A 800 B1200		
Wet sodic bottom (NV-28-13) 3838a	Alkali sacation	Greasewood	A 200 B 600		
Desert sands (NV-28-16) 3853a, 3853b, 3854-3853b (3853 part only)	Indian ricegrass	Ephedra Big sagebrush	A 250 B 400		

1/, 2/, 3/, see page 95 for explanation.

TABLE 7 (Cont'd)

RANGE MANAGEMENT 1/
MEASUREMENTS AND INTERPRETATIONS

RANGE SITE AND MAP SYMBOL 1/	KEY VEGETATIVE SPECIES (Potential)		PRODUCTIVE CAPACITY		REMARKS
	HERBACEOUS	WOODY	TOTAL POUNDS PER ACRE 3/	ACRES PER AUM	
Semidesert loam (NV-28-21) 3835a, 3835-3851a (3835 part only), 3835b, 3835-3851b (3835 part only), 3835-3834b (3835 part only), 3835-3854-3834b (3835 part only), 3856a, 3856aS, 3856b, 3856bS, 3856cdS, 3856-3858a, 3856-3858b, 3856-3861bS, 3858a, 3858-3859a, 3858-3859-3860a (3858 part only) 3859a, 3861-3856a	Indian ricegrass	Big sagebrush	A 350 B1000		Lower elevations, such as in Hot Creek Valley and Stone Cabin Valley,contain galleta grass. main soils with galleta are the 3835 map units (Deerlodge series)
Semidesert shallow loam (NV-28-22) 3850b, 3850cS, 3850dSS, 3852b, 3852bS, 3857a, 3857bS	Indian ricegrass	Shadscale Bud sagebrush Black sagebrush	A 250 B 875		

1/, 2/, 3/, see page 95 for explanation.

TABLE 7 (Cont'd)

RANGE MANAGEMENT 1/
MEASUREMENTS AND INTERPRETATIONS

RANGE SITE AND MAP SYMBOL 2/	KEY VEGETATIVE SPECIES (Potential)		PRODUCTIVE CAPACITY		REMARKS
	HERBACEOUS	WOODY	TOTAL POUNDS PER ACRE 3/	ACRES PER AUM	
Semidesert silt (NV-28-25) 3835-3851a (3851a part only) 3835-3851b (3851b part only) 3839a, 3839b, 3850-3851b (3851b part only)., 3851a, 3851al, 3851b, 3851-3851al, 3860a	Indian ricegrass galleta	Winterfat Big sagebrush Bud sagebrush	A 160 B 600		
Semidesert salty flat (NV-28-26) 3834sa, 3858-3859-3860a (3859 and 3860a parts only) 3859-3860a	Saltgrass Alkali sacation	Greasewood	A 200 B 500		
Map units with no range site assigned 3840de, 3841deSS, 3842bSS, 3842cSS, 3842dSS					These units produce a considerable amount of vegetation; however, because of steepness or stoniness, they are not easily accessible

1/ Placement of soils into range sites are tentative; placement is based on a cursory review of series type locations by John Riel, BLM, Range Conservationist, Battle Mountain, Nevada. Individual map units may be found to better fit other range sites when transects and vegetative clippings are obtained.

2/ See identification legend on page 5 for soil names.

3/ Yields are based on: A=unfavorable years, B=favorable years

TABLE 8

WATERSHED MANAGEMENT
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL (1)	SOIL NAME (2)	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES · MECHANICAL EQUIPMENT USAGE										
		RANGELAND		CHAINING 1/ (5)	CONTOUR FURROWING 2/ (6)	RIPPING 2/ (7)	PITTING 2/ (8)	TERRACING (9)	TRENCHING 3/ (10)	WATERSPREADING		4/ SEEDING Suitability (13)
		DRILL (3)	DISC PLOW (4)							CONSTRUCTION 3/ (11)	IRRIGABLE (12)	
3834a	Fang sl	Slight	Slight	NA	Mod.	sandy	loam	Sev. flooding	Mod. texture	Mod. texture	Sev. flooding	V.Poor Moisture
3834asi	Fang sil	Slight	Slight		Slight			Sev. flooding	Slight	Slight	Sev. flooding	V.Poor Moisture
3834ax 3834b 3834sa	Fang sl, slightly saline-alkali, eroded	Slight	Slight		Mod.	sandy	loam	Sev. flooding	Mod. texture	Mod. texture	Sev. flooding	V.Poor Moisture
3835a 3835b	Deerlodge gsl	Slight	Slight		Mod.	depth		Sev. depth	Mod. depth	Mod. depth	Mod. depth	V.Poor Moisture
3835-3834b	Deerlodge-Fang gsl; Deerlodge part is same as 3835b; Fang part is same as 3834b.											
3835-3851a	Deerlodge-Dun Glen gsl; Deerlodge part is same as 3835a; Dun Glen part is same as 3851a.			NA								
3835-3851b	Deerlodge-Dun Glen gsl; Deerlodge part is same as 3835b; Dun Glen part is same as 3851b.											
3835-3854-3834b	Deerlodge gsl - Indian Creek gls - Fang sl; Deerlodge part is same as 3835b; Indian Creek part is same as 3854b; Fang part is same as 3834b.											

1/, 2/, 3/, 4/, see page 102 for footnote.

TABLE 8 (Cont'd)

WATERSHED MANAGEMENT
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL (1)	SOIL NAME (2)	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES - MECHANICAL EQUIPMENT USAGE										
		RANGELAND		CHAINING 1/ (5)	CONTOUR FURROWING 2/ (6)	RIPPING 2/ (7)	PITTING 2/ (8)	TERRACING (9)	TRENCHING 3/ (10)	WATERSPREADING		4/ SEEDING Suitability (13)
		DRILL (3)	DISC PLOW (4)							CONSTRUCTION 3/ (11)	IRRIGABLE (12)	
3837b	Cliffdown gsl	Slight	Slight	NA	Mod	gravelly sl		Mod. texture	Mod. texture	Mod. texture	Mod. AWC	V.Poor Moisture
3838a	Saltair sil	Slight	Slight		Slight			Sev. water table	Slight	Slight	Sev. saline-alkali	V.Poor Moisture
3839a	Puddle fsl	Slight	Slight		Mod.	fine sandy loam		Mod. texture	Mod. texture	Mod. texture	Mod. AWC	V.Poor Moisture
3839b	Puddle gsl	Slight	Slight		Mod.	gravelly sl		Mod. texture	Mod. texture	Mod. texture	Mod. AWC	V.Poor Moisture
3840de	Rock and shallow soils	Sev. rock	Sev. rock		Severe	Rock outcrop		Severe	Rock Outcrop			V.Poor Rock
3841deSS	Very cobbly soils	Sev. slope			Severe	slopes		Sev. slopes	Mod. slope	Mod. slope	Sev. slope	V.Poor coarse frag.
3842bSS 3842cSS 3842dSS	Very stony soils	Sev. stones	Sev. stones	NA	Sev. stones	Sev. stones	Sev. stones	Sev. stones	Sev. stones	Sev. stones	Sev. stones	V.Poor stones

1/, 2/, 3/, 4/, see page 102 for footnotes.

TABLE 8 (Cont'd)

WATERSHED MANAGEMENT

MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL (1)	SOIL NAME (2)	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES MECHANICAL EQUIPMENT USAGE									
		RANGELAND		CHAINING 1/ (5)	CONTOUR FURROWING 2/ (6)	RIPPING 2/ (7)	PITTING 2/ (8)	TERRACING (9)	TRENCHING 3/ (10)	WATERSPREADING	4/ SEEDING Suitability (13)
		DRILL (3)	DISC PLOW (4)							CONSTRUCTION 3/ (11)	IRRIGABLE (12)	
3850cS	Ursine cob ls	Slight	Mod. depth	NA	"	"	"	Sev. depth	Sev. depth	Sev. depth	Sev. depth	V.Poor Moisture
3850dSS	Ursine v st ls	Sev. stones	Sev. stones		"	"	"	Sev. depth	Sev. depth	Sev. depth	Sev. depth	V.Poor Moisture
3850-3851b	Ursine gravelly	gsl-Dun	Glen sl	Ursine	part is	same as	3850b;	Dun Glen	part is	same as	3851b.	
3851a 3851b	Dun Glen sl	Slight	Slight		Mod.	sandy	loam	Mod. texture	Mod. texture	Mod. texture	Slight	V.Poor Moisture
3851-3851a1	Dun Glen soils.	The Dun	Glen sl	part is	the same	as	3851a; the	Dun Glen	sil	part	follows.	
	Dun Glen sil	Slight	Slight		Slight	Sandy	loam	Slight	Slight	Slight	Slight	V.Poor Moisture
3852b	Spanel gsl	Slight	Mod. depth		Severe	shallow	depth	Sev. depth	Sev. depth	Sev. depth	Sev. depth	V.Poor Moisture
3852bs	Spanel st gsl	Mod. stones	Mod. stones		"	"	"	Sev. depth	Sev. depth	Sev. depth	Sev. depth	V.Poor Moisture

TABLE 8 (Cont'd)

WATERSHED MANAGEMENT

MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL (1)	SOIL NAME (2)	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES - MECHANICAL EQUIPMENT USAGE										
		RANGELAND		CHAINING 1/ (5)	CONTOUR FURROWING 2/ (6)	RIPPING 2/ (7)	PITTING 2/ (8)	TERRACING (9)	TRENCHING 3/ (10)	WATERSPREADING		4/ SEEDING Suitability (13)
		DRILL (3)	DISC PLOW (4)							CONSTRUCTION 3/ (11)	IRRIGABLE (12)	
3853a	Alcorn ls	Slight	Slight	NA	Severe	loamy sand		Mod. texture	Mod. texture	Mod. texture	Mod. texture	V.Poor Moisture
3853b	Alcorn ls	Slight	Slight		"	"	"	Mod. texture	Mod. texture	Mod. texture	Mod. texture	V.Poor Moisture
3854b	Indian Creek gls	Slight	Mod. depth		Severe	shallow depth		Sev. depth	Sev. depth	Sev. depth	Sev. depth	Poor Moisture
3854bcSS	Indian Creek vcob sl	Sev. cobbles	Sev. cobbles		"	"	"	Sev. depth	Sev. depth	Sev. depth	Sev. depth	V.Poor AWC
3854-3853b	Indian Creek-Alcorn gls	The Indian Creek part is the same as 3854b; the Alcorn part is the same as 3853b.										
3856a 3856aS 3856b 3856bS 3856cdS	Olson gsl & cob sl	Slight	Mod. depth		Severe	shallow depth		Sev. depth	Sev. depth	Sev. depth	Sev. depth	Poor Moisture

1/, 2/, 3/, 4/, see page 102 for footnote.

TABLE 8 (Cont'd)

WATERSHED MANAGEMENT

MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL (1)	SOIL NAME (2)	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES - MECHANICAL EQUIPMENT USAGE										
		RANGELAND		CHAINING 1/ (5)	CONTOUR FURROWING 2/ (6)	RIPPING 2/ (7)	PITTING 2/ (8)	TERRACING (9)	TRENCHING 3/ (10)	WATERSPREADING		4/ SEEDING Suitability (13)
		DRILL (3)	DISC PLOW (4)							CONSTRUCTION 3/ (11)	IRRIGABLE (12)	
3856-3858a	Olson-Haploxerollic Durorthid gsl.			NA Olson part is same as 3856a;								
3856-3858b	Olson-haploxerollic Durorthid gsl.			NA Olson part is the same as 3856b;								
	Haploxerollic Durorthid part	Slight	Slight	NA	Mod. sandy loam			Mod. texture	Mod. texture	Mod. texture	Slight	Fair-Poor Moisture
3856-3861bS	Olson-Xerollic Xerollic Haplargid.			Olson part is same as 3856bS.								
	Xerollic Haplargid part	Slight	Slight	NA	Mod. sandy loam			Sligh	Slight	Slight	Slight	Fair-Poor Moisture
3857a	Ratto gsl	Slight	Mod. depth		Severe	shallow	depth	Sev. depth	Sev. depth	Sev. depht	Sev. depth	Fair-Poor Moisture
3857bS	Ratto st gsl	Mod. stones	Mod. depth		"	"	"	Sev. depth	Sev. depth	Sev. depth	Sev. depth	Fair-Poor Moisture
3858a	Haploxerollic Durorthid gsl	Slight	Slight		Mod.	sandy loam		Mod. texture	Mod. texture	Mod. texture	Slight	Fair-Poor Moisture

TABLE 8 (Cont'd)

WATERSHED MANAGEMENT
MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL (1)	SOIL NAME (2)	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES - MECHANICAL EQUIPMENT USAGE										
		RANGELAND		CHAINING 1/ (5)	CONTOUR FURROWING 2/ (6)	RIPPING 2/ (7)	PITTING 2/ (8)	TERRACING (9)	TRENCHING 3/ (10)	WATERSPREADING		4/ SEEDING Suitability (13)
		DRILL (3)	DISC PLOW (4)							CONSTRUCTION 3/ (11)	IRRIGABLE (12)	
3858-3859a	Haploxerollic Duorthid-Shipley as 3859a.			NA gsl. Hap	oxerollic Durorthid part			is same	as 3858a; Shipley part			is same
3858-3859-3860a	Haploxerollic Durorthid-Shipley same as 3858a; Shipley			gsl-Bereniston				sil, saline-alkali; Haploxerollic Durorthid part of 3859-3860a map unit.				is the
	Bereniston part	Slight	Slight	NA	S l i g h t			Sev. flooding	Slight	Slight	Sev. flooding	Fair-Poor Moisture
3859-3860a	Shipley gravelly sl-Bereniston sil, saline-alkali											
	Shipley part	Slight	Slight	NA	Mod. sandy loam			Sev. flooding	Mod. texture	Mod. texture	Sev. flooding	Fair-Poor Moisture
	Bereniston part	Slight	Slight		S l i g h t			Sev. flooding	Slight	Slight	Sev. flooding	Fair-Poor Moisture
3860a	Bereniston sil	Slight	Slight		S l i g h t			Sev. flooding	Slight	Slight	Sev. flooding	Fair-Poor Moisture
3861-3856a	Xerollic Haplargid-Olson sl. Olson part is same as 3856a.											
	Xerollic Haplargid part	Slight	Slight	NA	Mod. sandy loam			Slight	Slight	Slight	Sev. flooding	Fair-Poor Moisture

1/, 2/, 3/, 4/, see page 102 for footnotes.

TABLE 8 (Cont'd)

WATERSHED MANAGEMENT

MEASUREMENTS AND INTERPRETATIONS

MAP SYMBOL	SOIL NAME	SOIL LIMITATIONS TO VEGETATIVE MANIPULATION AND WATERSHED TILLAGE PRACTICES MECHANICAL EQUIPMENT USAGE										
		RANGELAND		CHAINING	CONTOUR FURROWING	RIPPING	PITTING	TERRACING	TRENCHING	WATERSPREADING		4/ SEEDING
		DRILL	DISC PLOW							CONSTRUCTION	IRRIGABLE	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Suitability (13)
3862a	Hutton sicl	Slight	Slight	NA	Slight	Slight	Slight	Sev. flooding	Slight	Slight	Sev. flooding	Fair-Poor Moisture
3862ax	Hutton sicl saline-alkali, eroded	Slight	Slight		Slight	Slight	Slight	Sev. flooding	Slight	Slight	Sev. flooding	V.Poor saline-alkali

1/ Not applicable, all units.

2/ Contour furrowing, ripping and pitting all use the same criteria for rating.

3/ Trenching and waterspreading-construction use the same criteria for rating.

4/ Criteria for seeding taken from "Interim Guide for Rating Soils According To Their Soil Suitability For Rangeland Seeding - Nevada", by James S. Hagihara, Carl M. Rice, Lucien N. Langan, 1972.

TABLE 9

WILDLIFE MANAGEMENT

MEASUREMENTS AND INTERPRETATIONS

BIOTIC COMMUNITY 1/	KEY SPECIES			REMARKS
	WILDLIFE 2/	VEGETATIVE (Potential)		
		HERBACEOUS	WOODY	
SAGEBRUSH UPLAND Range Sites: NV-28-21 Soil Mapping Units: 3835a, 3835-3851a (3835 part only), 3835b, 3835-3851b (3835 part only), 3835-3834b (3835 part only), 3835-3854-3834b (3835 part only), 3856a, 3856aS, 3856b, 3856bS, 3856cdS, 3856-3858a, 3856-3858b, 3856-3861bS, 3858a, 3858-3859a, 3858-3859-3860a (3858 part only) 3859a, 3861-3856a	Sage grouse (Mule deer) Pronghorn antelope	Indian ricegrass Galleta Blue grama	Big sagebrush	
PINYON-JUNIPER WOODLAND Range Sites: None assigned Soil Mapping Units: 3840de, 3841deSS, 3842bSS, 3842cSS, 3842dSS	Mule deer Chuckar (Gambel's Quail)	Indian ricegrass	Pinyon pine Juniper Cowania Bitterbrush	

1/ See Range Management Table for Range Site names

2/ Species in parenthesis occur only in limited numbers in Biotic Community.

TABLE 9 (Cont'd)

WILDLIFE MANAGEMENT
MEASUREMENTS AND INTERPRETATIONS

BIOTIC COMMUNITY 1/	KEY SPECIES			REMARKS
	WILDLIFE 2/	VEGETATIVE (Potential)		
		HERBACEOUS	WOODY	
BOTTOM BRUSH/GRASSLAND Range Sites: NV-28-4 NV-28-6 NV-28-9 NV-28-13 NV-28-26 Soil Mapping Units: 3834a, 3834ax, 3834b, 3834sa, 3835-3834b (3834b part only), 3835-3854-3834b (3834b part only), 3838a, 3859-3860a, 3862a, 3862ax	Pronghorn antelope Chuckar 3/ Gambel's 3/ Quail	Saltgrass Alkali sacaton Basin wild-rye Sedge sp.	Big sagebrush Greasewood Rubber rabbitbrush	
SEMIDESERT SHRUB Range Sites: NV-28-1 NV-28-16 NV-28-22 NV-28-25 Soil Mapping Units: 3834asi, 3835-3851a (3851a part only), 3835-3854-3834b (3854 part only), 3837b, 3839a, 3839b, 3850b, 3850cS, 3850dSS, 3850-3851b, 3851a, 3851a1, 3851b, 3851-3851a1, 3852b, 3852bS, 3853a, 3853b, 3854b, 3854bcSS, 3854C, 3854dSS, 3854-3853b, 3857a, 3857bS, 3860a	Pronghorn antelope (Sage grouse) (Chuckar) Gambel's Quail	Indian ricegrass	Shadscale Bud sage-brush Winterfat Black sagebrush	

1/ See Range Management Table for Range Site names.
2/ Species in parenthesis occur only in limited numbers in Biotic Community.
3/ Occur mainly where bottomland is surrounded by steep rocky areas.

TABLE 10

SOIL COMPACTION HAZARD

FOR VARIOUS KINDS OF TRAFFIC

Soil Map Symbols by Groups	Kind of Traffic			
	livestock	light vehicles	heavy vehicles	range plows
all map units in survey area except these following:	MOD	MOD	MOD	MOD
3838a, 3862a, 3862ax	SEV	SEV	SEV	SEV
3840de, 3841deSS, 3842bSS, 3842cSS, 3842dSS	SLI	SLI	SLI	SLI

TABLE 11

ACRES AND PROPORTIONATE EXTENT OF SOILS

AREAS	Hot Creek South		Hot Creek North		Stone Cabin South		Stone Cabin North		Little Fish Lake South		Little Fish Lake North		Monitor South		Monitor North		Ione		Total Area	
Map Symbol	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
3834a	300.7	0.9	1,354.9	3.7	73.3	0.2	2,305.5	8.3	- -	-	- -	-	- -	-	- -	-	1,601.6	3.8	5,636.0	1.9
3834asi	1,462.5	4.2	864.8	2.4	- -	-	837.7	3.0	- -	-	- -	-	- -	-	- -	-	4,004.1	9.5	7,169.1	2.4
3834ax	- -	-	- -	-	838.9	2.5	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	838.9	0.3
3834b	916.8	2.6	2,259.1	6.2	1,718.2	5.1	70.4	0.3	- -	-	- -	-	- -	-	- -	-	- -	-	4,964.5	1.7
3834sa	1,622.1	4.7	- -	-	1,036.8	3.0	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	2,658.9	0.9
3835a	- -	-	- -	-	65.9	0.2	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	65.9	T
3835b	1,358.5	3.9	3,275.9	8.9	9,352.7	27.4	598.4	2.2	- -	-	- -	-	- -	-	- -	-	814.0	1.9	15,399.5	5.2
3835-3834b	556.8	1.6	7,870.1	21.3	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	8,426.9	2.8
3835-3851a	- -	-	- -	-	6,718.7	19.8	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	6,718.7	2.3
3835-3851b	- -	-	- -	-	1,135.7	3.3	6,082.2	22.0	- -	-	- -	-	- -	-	- -	-	- -	-	7,217.9	2.4
3835-3854-3834b	- -	-	- -	-	- -	-	2,171.7	7.8	- -	-	- -	-	- -	-	- -	-	- -	-	2,171.7	0.7
3837b	7,538.7	21.8	- -	-	183.2	0.5	81.0	0.3	- -	-	- -	-	- -	-	- -	-	- -	-	7,802.9	2.6
3838a	649.6	1.9	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	649.6	0.2
3839a	582.8	1.7	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	582.8	0.2
3839b	653.3	1.9	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	653.3	0.2
3840de	7,431.2	21.4	5,933.3	16.2	7,220.5	21.2	3,653.6	13.2	8,152.5	24.2	849.3	4.0	8,128.8	36.4	715.9	1.6	1,903.6	4.5	43,988.7	14.8
3841de5S	3,429.8	9.9	7,075.9	19.3	- -	-	2,939.0	10.6	9,117.4	27.1	3,109.6	14.7	755.2	3.4	- -	-	1,549.1	3.7	27,976.0	9.4
3842bSS	103.9	0.3	317.1	0.9	120.9	0.4	1,323.5	4.8	563.1	1.7	- -	-	371.7	1.7	2,523.9	5.7	- -	-	5,324.1	1.8
3842cSS	1,889.3	5.4	484.8	1.3	- -	-	869.4	3.1	- -	-	- -	-	- -	-	- -	-	236.3	.6	3,479.8	1.2
3842dSS	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	93.4	.2	- -	-	93.4	T
3850cS	1,778.0	5.1	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	1,778.0	0.6
3850dSS	493.7	1.4	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	493.7	0.2
3850-3851b	2,962.1	8.5	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	2,962.1	1.0
3851a	976.2	2.8	- -	-	2,586.4	7.6	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	3,562.6	1.2
3851b	- -	-	600.1	1.6	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	600.1	0.2
3851-3851a1	- -	-	- -	-	1,040.4	3.1	- -	-	- -	-	- -	-	- -	-	- -	-	28,803.4	68.5	1,040.4	0.4
3852b	- -	-	4,693.7	12.8	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	3,163.9	7.5	33,497.1	11.3
3852bS	- -	-	615.9	1.7	238.1	0.7	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	4,017.9	1.4
3853a	- -	-	- -	-	194.2	0.6	3,804.9	13.7	- -	-	- -	-	- -	-	- -	-	- -	-	3,999.1	1.3
3853b	- -	-	159.9	0.4	1,025.8	3.0	552.6	2.0	- -	-	- -	-	- -	-	- -	-	- -	-	1,738.3	0.6
3854b	- -	-	- -	-	465.3	1.4	714.5	2.6	- -	-	- -	-	- -	-	- -	-	- -	-	1,179.8	0.4
3854bcSS	- -	-	1,205.5	3.3	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	1,205.5	0.4
3854-3853b	- -	-	- -	-	- -	-	1,703.6	6.1	- -	-	- -	-	- -	-	- -	-	- -	-	1,703.6	0.6
3856a	- -	-	- -	-	- -	-	- -	-	1,107.3	3.3	6,759.3	31.9	3,229.0	14.4	5,548.7	12.6	- -	-	16,644.3	5.6
3856aS	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	367.8	.8	- -	-	367.8	0.1
3856b	- -	-	- -	-	- -	-	- -	-	1,360.3	4.0	5,672.8	26.7	5,420.2	24.2	4,300.9	9.8	- -	-	16,754.2	5.7
3856bS	- -	-	- -	-	- -	-	- -	-	3,448.3	10.2	240.4	1.1	993.1	4.4	2,934.2	6.7	- -	-	7,616.0	2.6
3856cdS	- -	-	- -	-	- -	-	- -	-	142.4	0.4	- -	-	124.9	0.6	1,179.9	2.7	- -	-	1,447.2	0.5
3856-3858a	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	1,992.0	4.5	- -	-	1,992.0	0.7
3856-3858b	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	1,199.7	2.7	- -	-	1,199.7	0.4
3856-3861bS	- -	-	- -	-	- -	-	- -	-	2,543.5	7.6	- -	-	- -	-	- -	-	- -	-	2,543.5	0.9
3857a	- -	-	- -	-	- -	-	- -	-	996.5	3.0	- -	-	1,311.2	5.9	- -	-	- -	-	2,307.7	0.8
3857bS	- -	-	- -	-	- -	-	- -	-	442.9	1.3	- -	-	- -	-	84.9	.2	- -	-	527.8	0.2
3858a	- -	-	- -	-	- -	-	- -	-	442.9	1.3	- -	-	802.8	3.6	1,253.5	2.9	- -	-	2,056.3	0.7
3858-3859a	- -	-	- -	-	- -	-	- -	-	4,378.4	13.0	- -	-	- -	-	1,335.5	3.0	- -	-	5,713.9	1.9
3858-3859-3860a	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	3,330.4	7.6	- -	-	3,330.4	1.1
3859a	- -	-	- -	-	- -	-	- -	-	- -	-	1,673.5	7.9	1,177.4	5.3	5,025.2	11.5	- -	-	7,876.1	2.7
3859-3860a	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	- -	-	10,876.7	24.8	- -	-	10,876.7	3.7
3860a	- -	-	- -	-	- -	-	- -	-	- -	-	2,123.0	10.0	- -	-	79.2	.2	- -	-	2,202.2	0.7
3861-3856a	- -	-	- -	-	- -	-	- -	-	221.5	0.7	- -	-	- -	-	1,109.2	2.5	- -	-	1,330.7	0.4
3862a	- -	-	- -	-	- -	-	- -	-	664.4	2.0	340.3	1.6	29.7	0.1	- -	-	- -	-	1,034.4	0.3
3862ax	- -	-	- -	-	- -	-	- -	-	- -	-	455.8	2.1	- -	-	- -	-	- -	-	455.8	0.2
Water	- -	-	- -	-	- -	-	- -	-	512.5	1.5	- -	-	- -	-	- -	-	- -	-	512.5	0.2
TOTALS Acres	34,706.0		36,711.0		34,015.0		27,708.0		33,651.0		21,224.0		22,344.0		43,951.0		42,076.0		296,386.0	
TOTAL %		100		100		100		100		100		100		100		100		100		
Private Acres (Included in above totals)	225.0		160.0		1,640.0		80.0		1,520.0		0		60.0		3,560.0		60.0		7,305.0	

GENERAL SOIL MAP LEGEND

Soil Associations 1/

1 Typic and Xerollic Durargids and Xerollic Durorthids:
Shallow to moderately deep upland soils with duripans, mesic

2 Typic Torriorthents, Typic Calciorthids and Typic Camborthids:
Deep upland soils, mesic

3 Typic Torrifluvents and Typic Salorthids:
Deep bottomland soils, mesic

4 Xerollic Durargids and Haploxerollic Durorthids:
Shallow to moderately deep upland soils with duripans, frigid

5 Xerollic Haplargids:
Deep upland soils, frigid

6 Xeric Torriorthents and Typic Haplaquolls:
Deep bottomland soils, frigid

7 Miscellaneous areas
Rock outcrop, Lithic Xeric Torriorthents, Lithic Xerollic Durargids, Xeric Torriorthents, and Xerollic Camborthids.

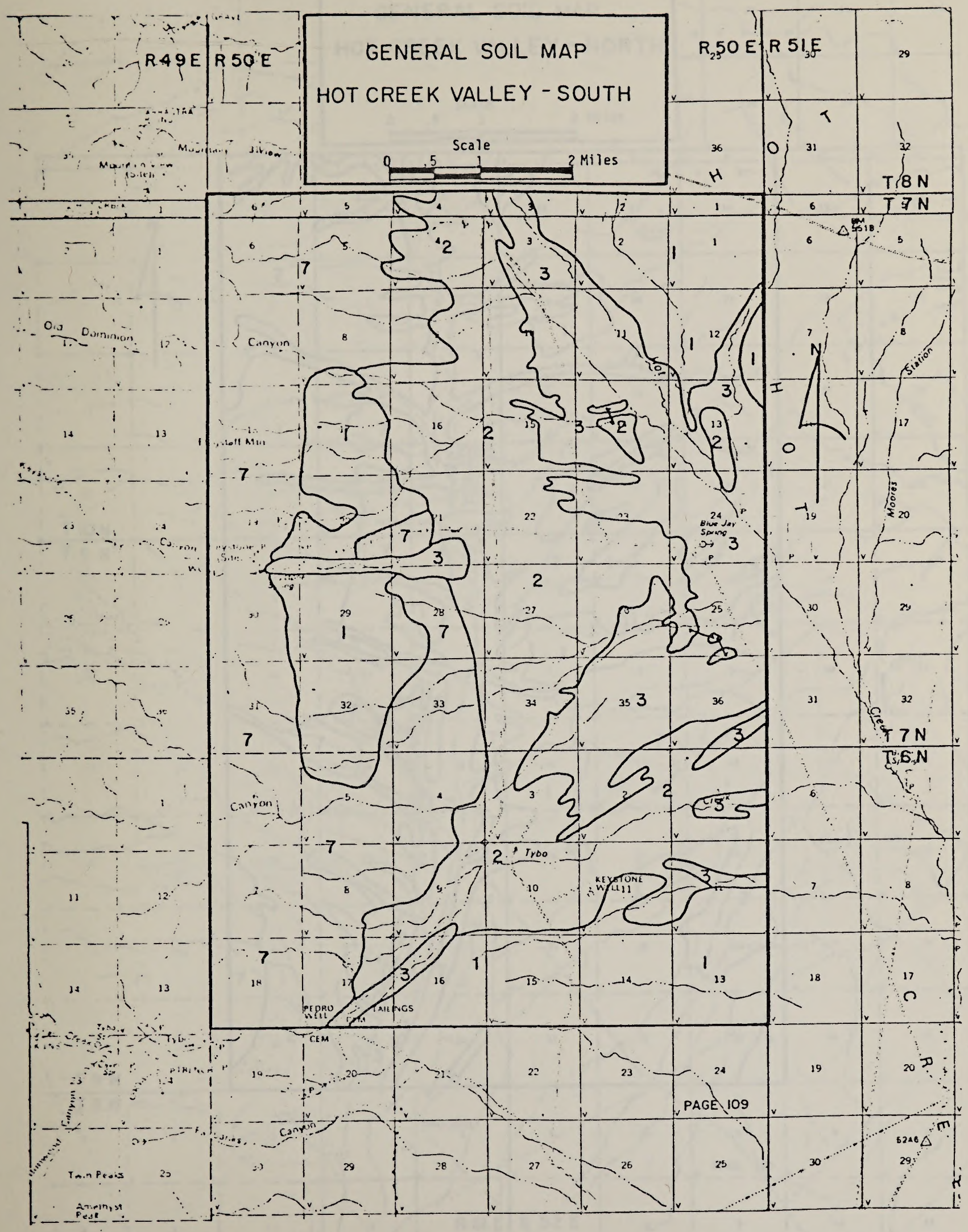
Water

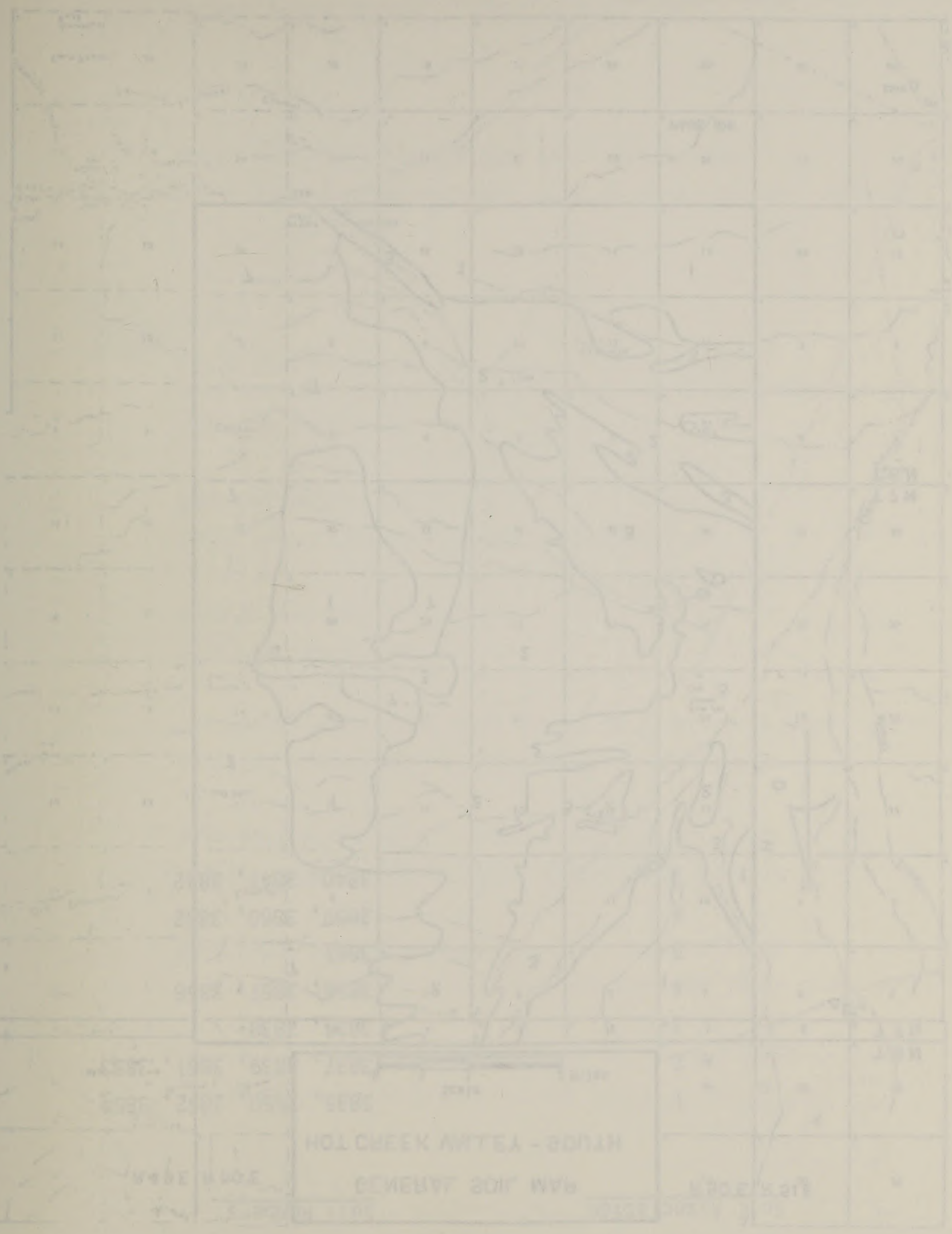
1/ These associations were developed by combining soil mapping units from the detailed soil maps, as follows:

Soil Association	Soil Numbers
1	3835, 3850, 3852, 3854
2	3837, 3839, 3851, 3853
3	3834, 3838
4	3856, 3857, 3858
5	3861
6	3859, 3860, 3862
7	3840, 3841, 3842

GENERAL SOIL MAP

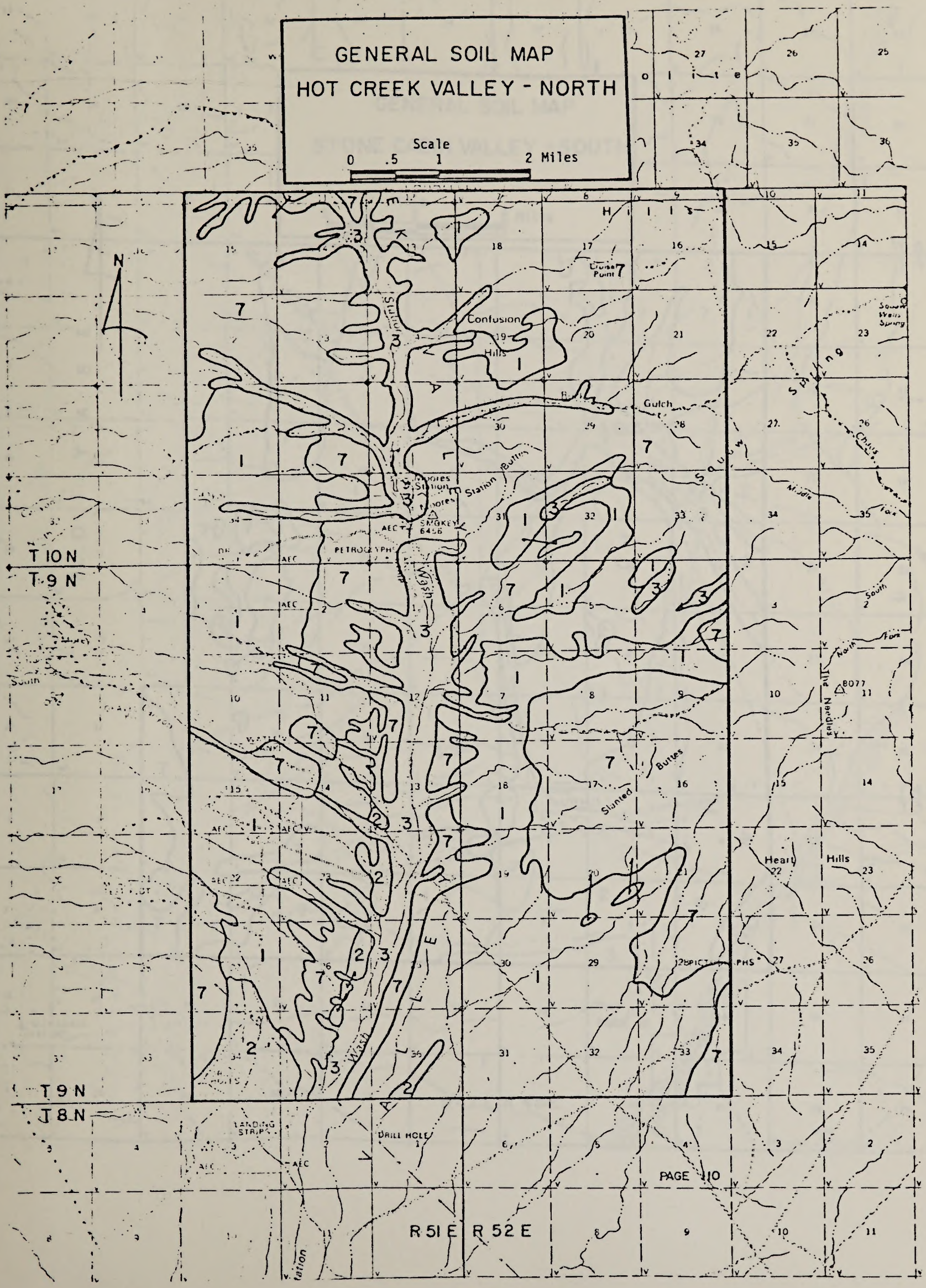
HOT CREEK VALLEY - SOUTH

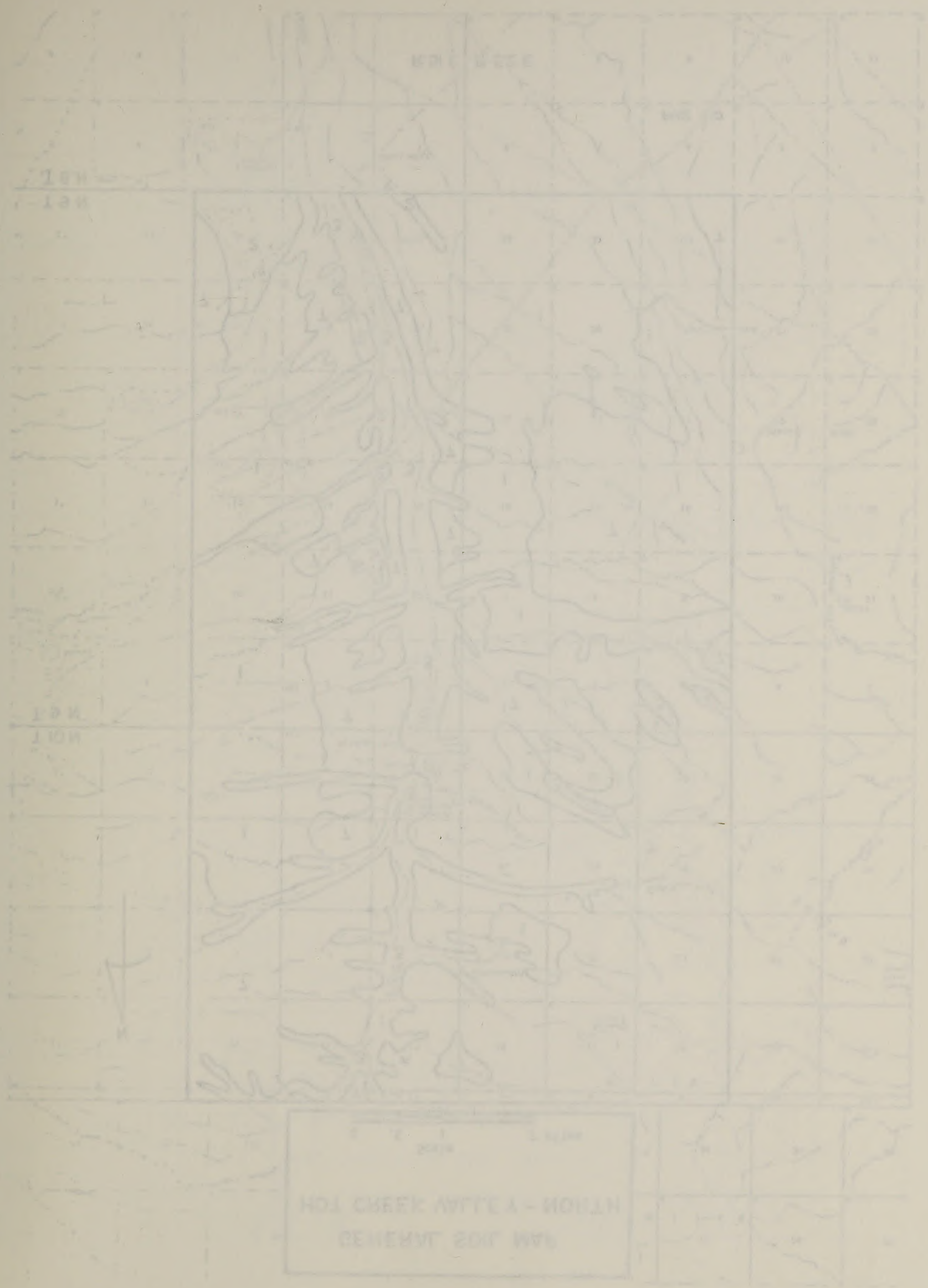


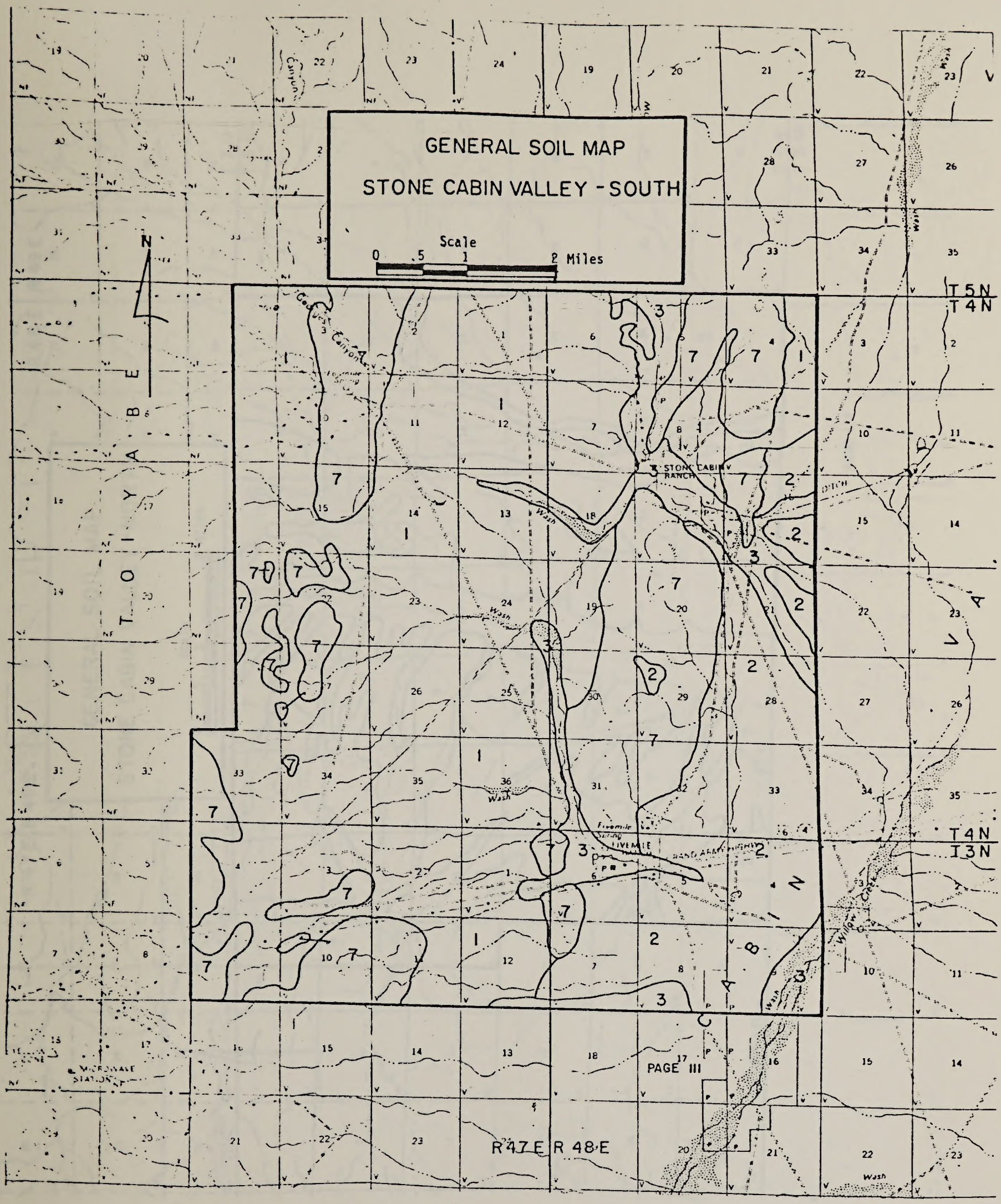


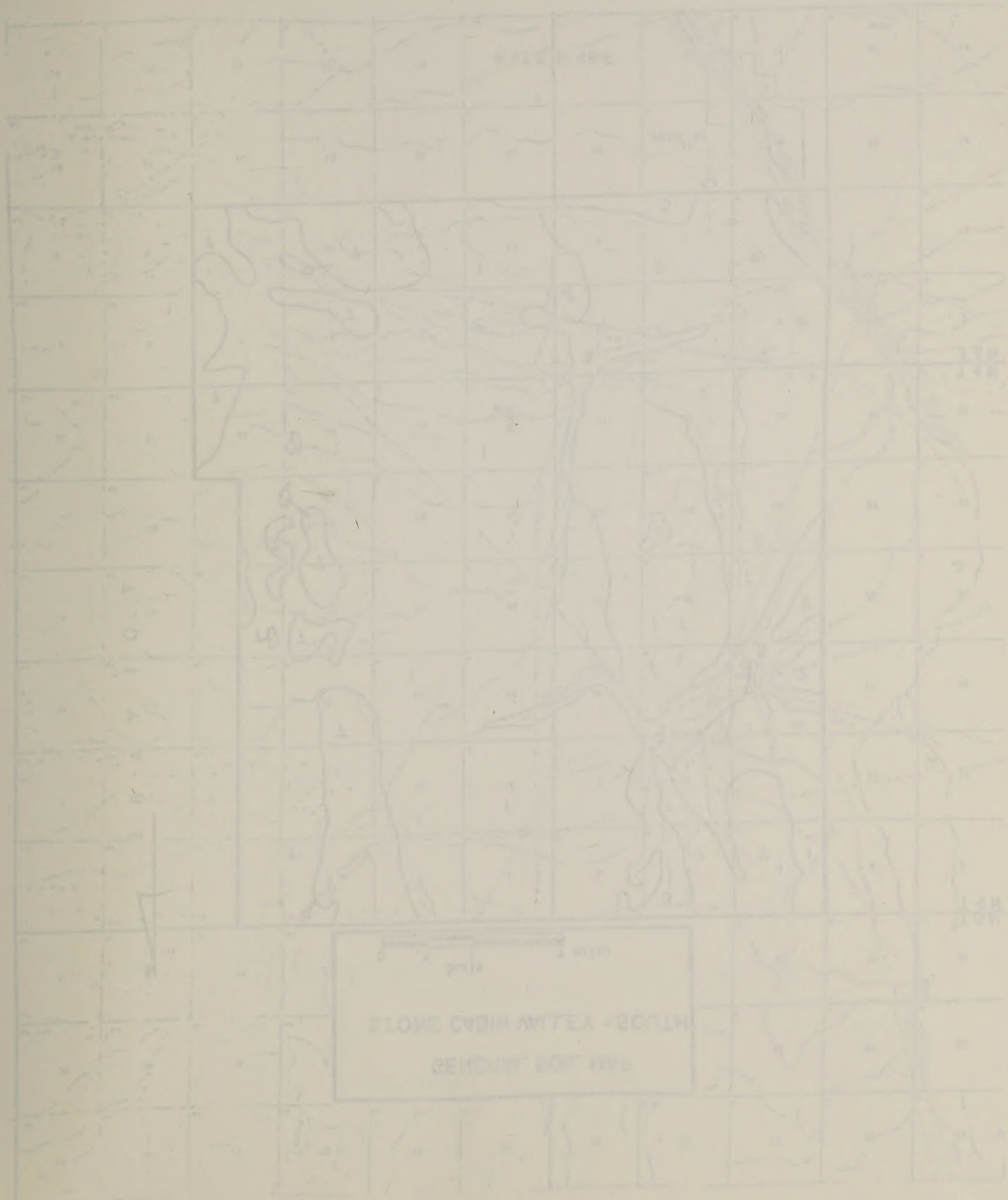
GENERAL SOIL MAP
HOT CREEK VALLEY - NORTH

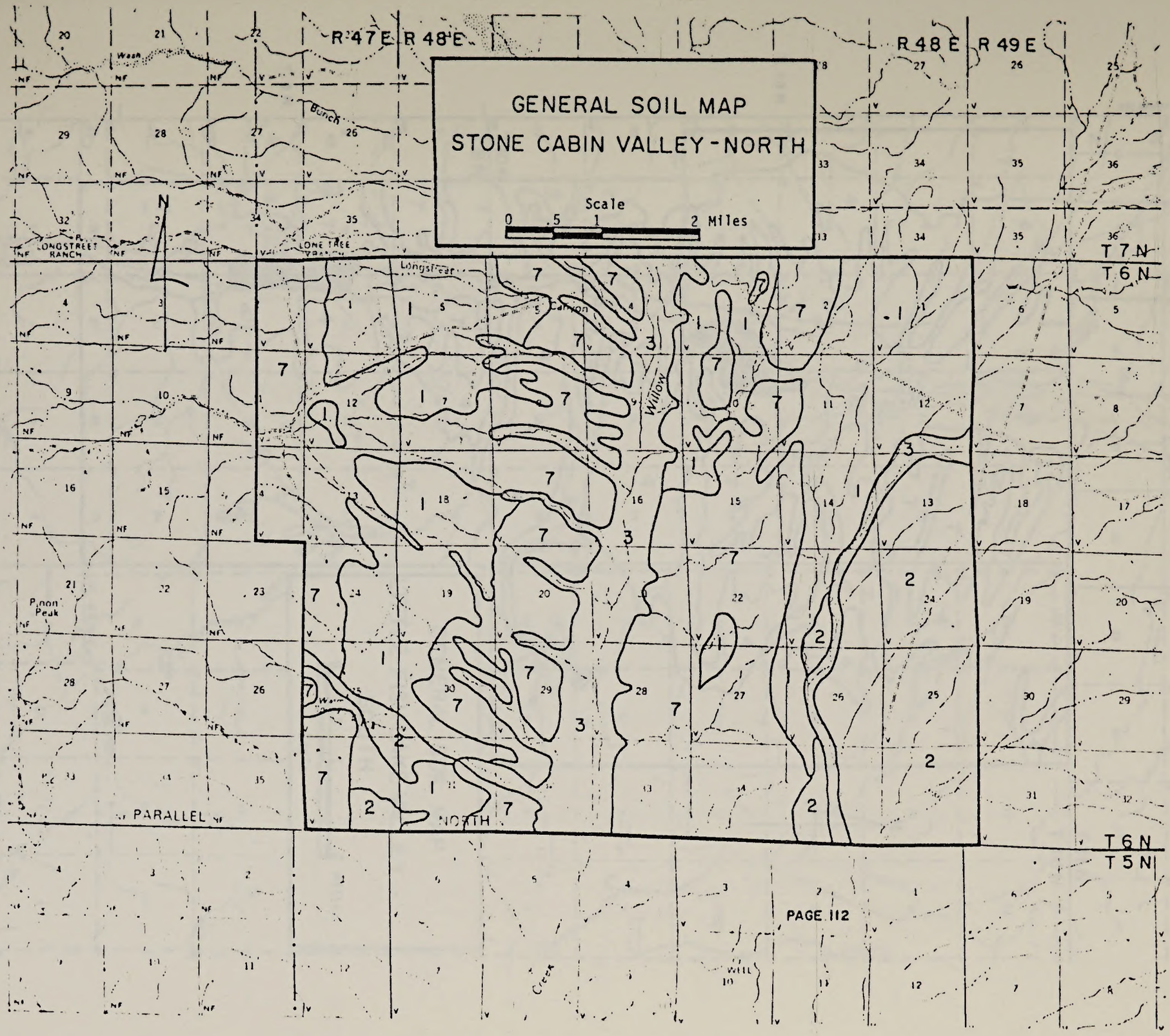
Scale
0 .5 1 2 Miles

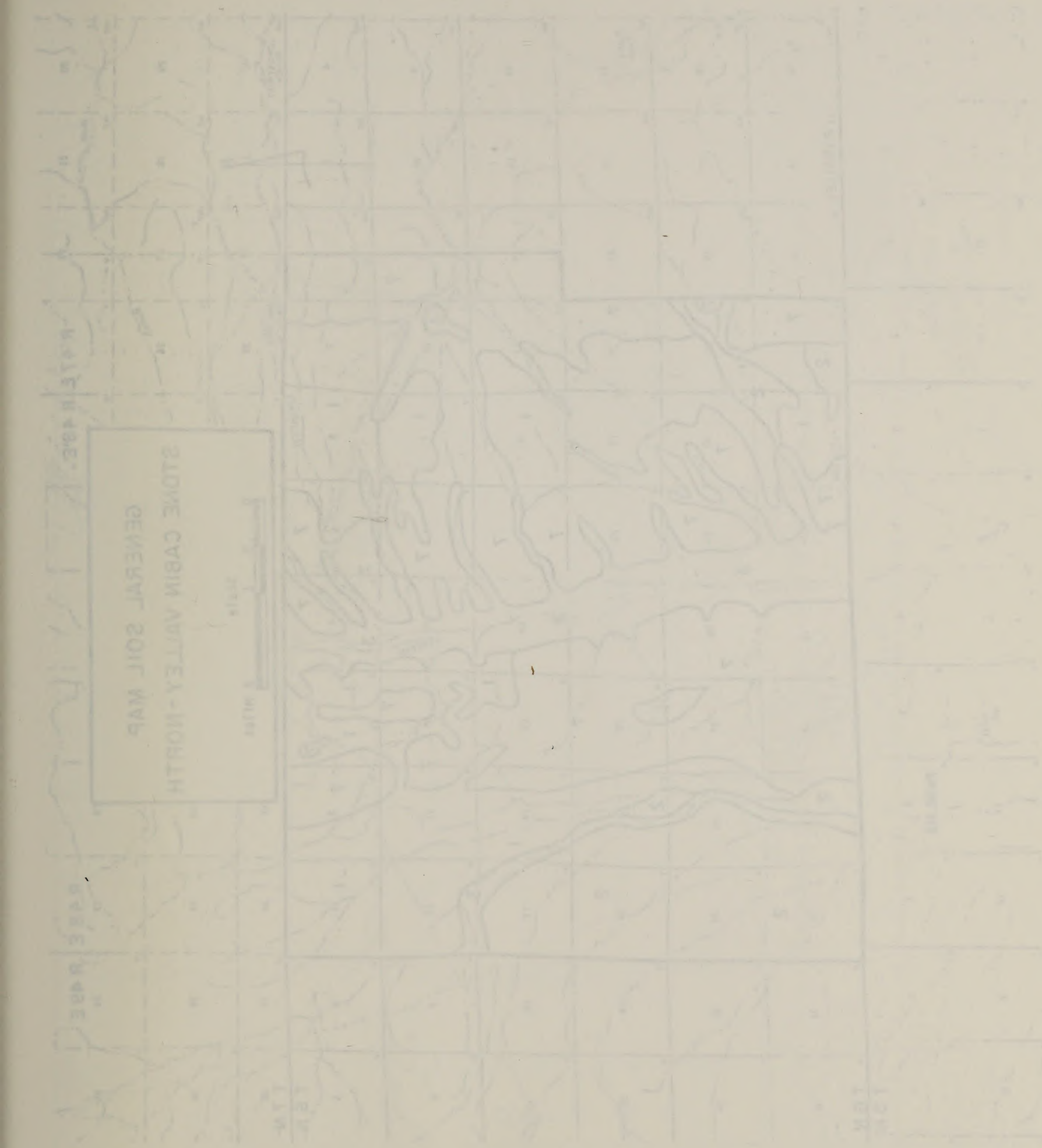


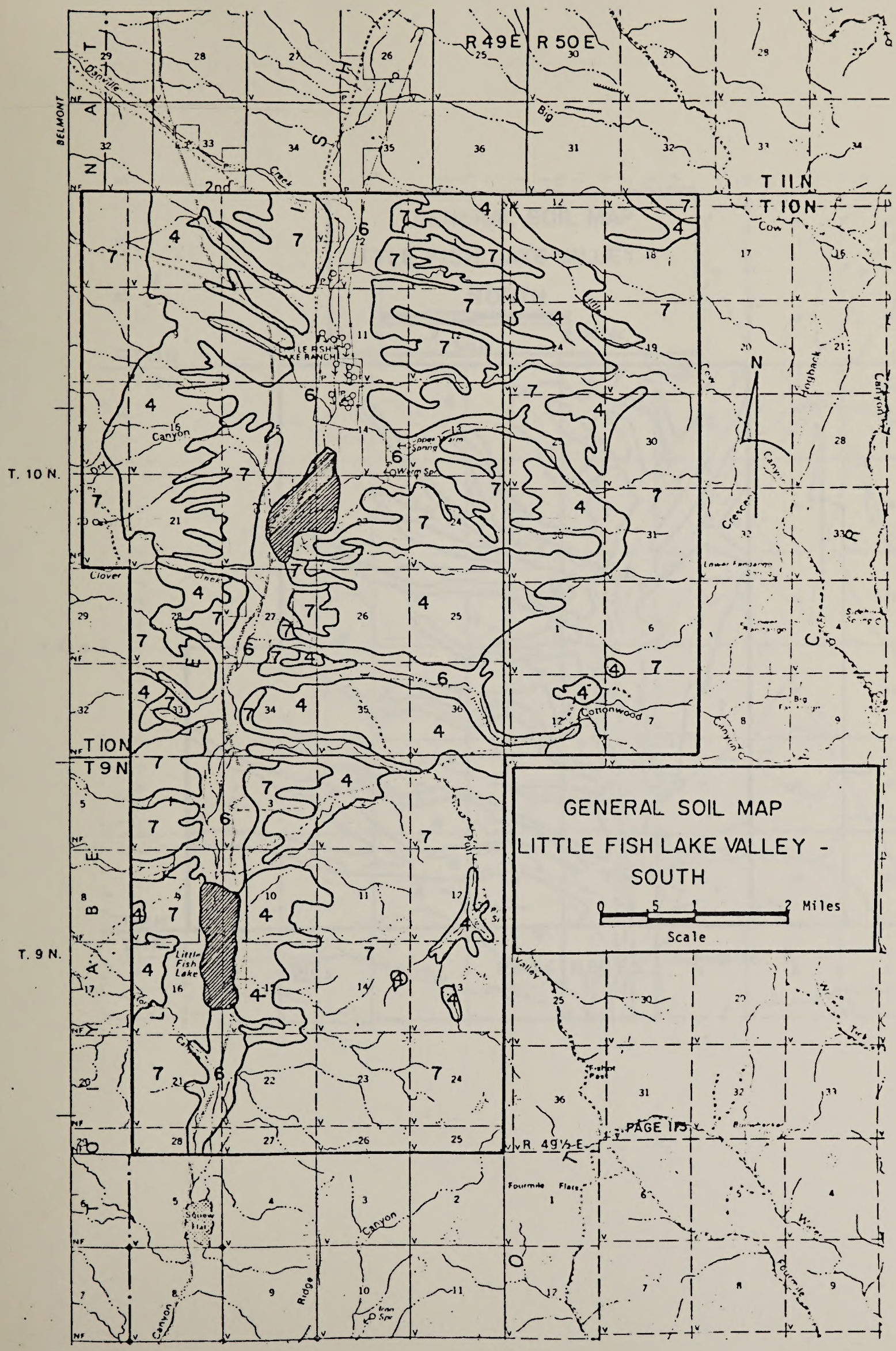


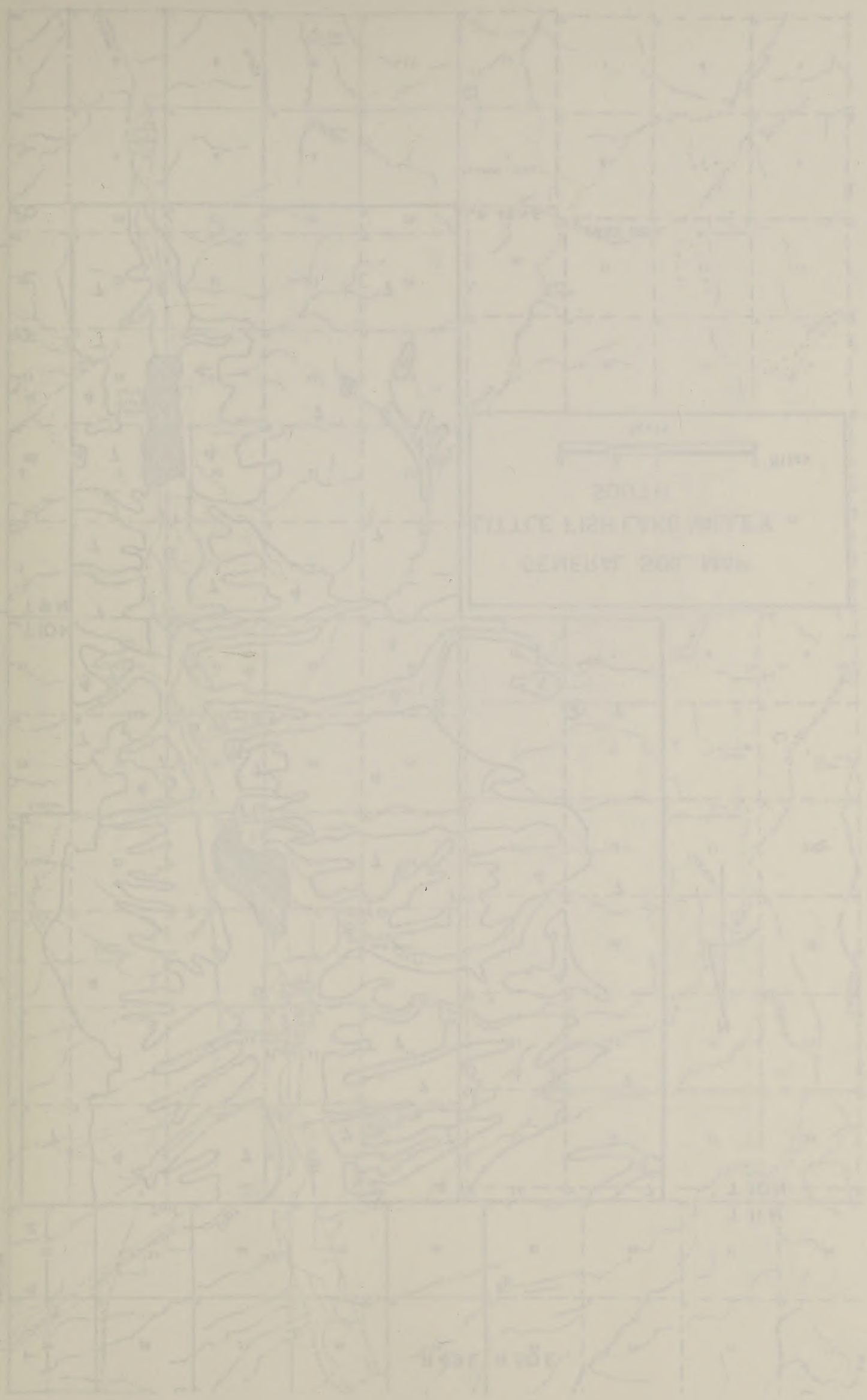

GENERAL SOIL MAP
STONE CABIN VALLEY - SOUTH
Scale
0 .5 1 2 Miles
N
T 5 N
T 4 N
T 4 N
T 3 N
R 47 E
R 48 E
STONE CABIN RANCH
PAGE III

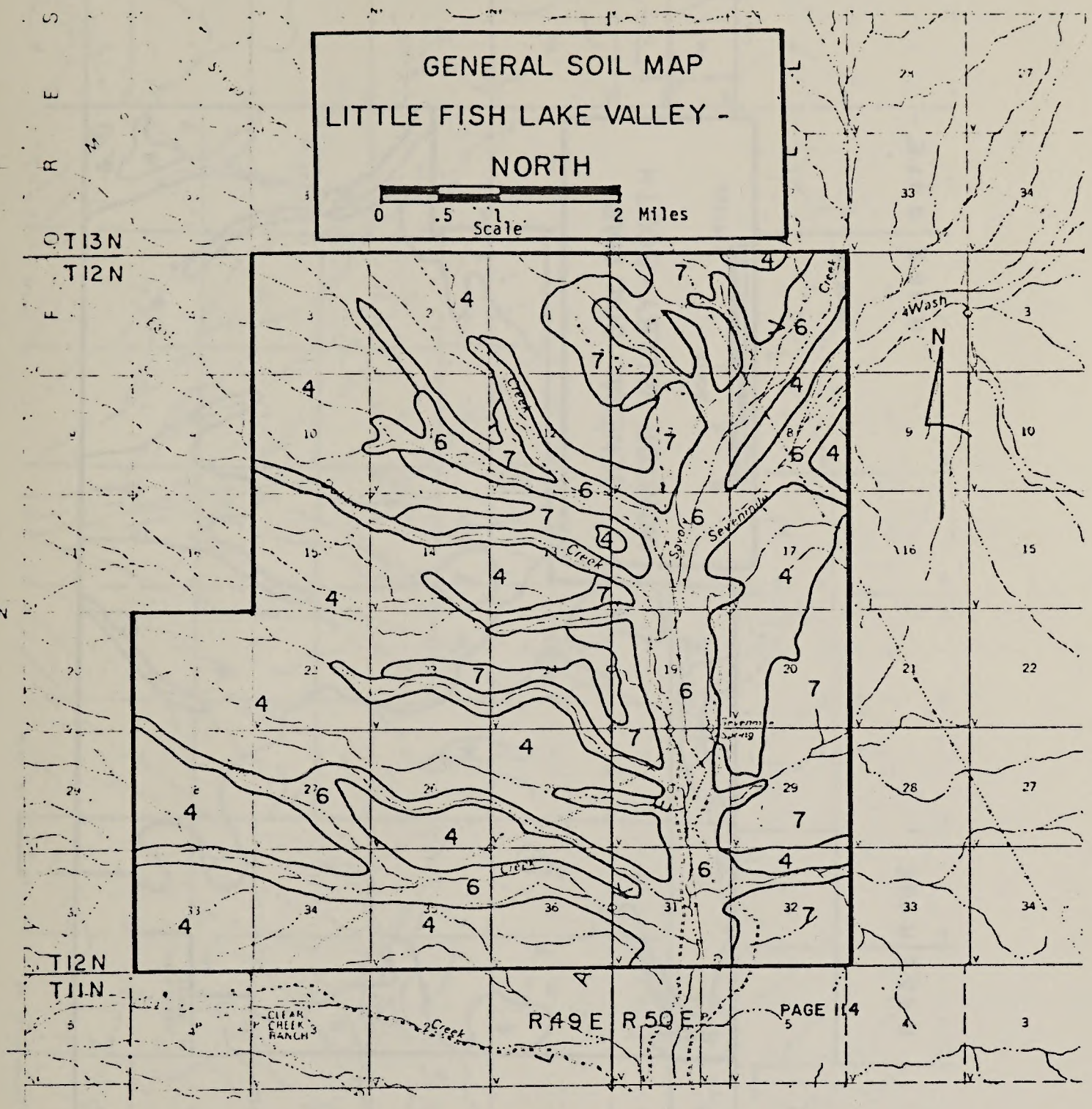


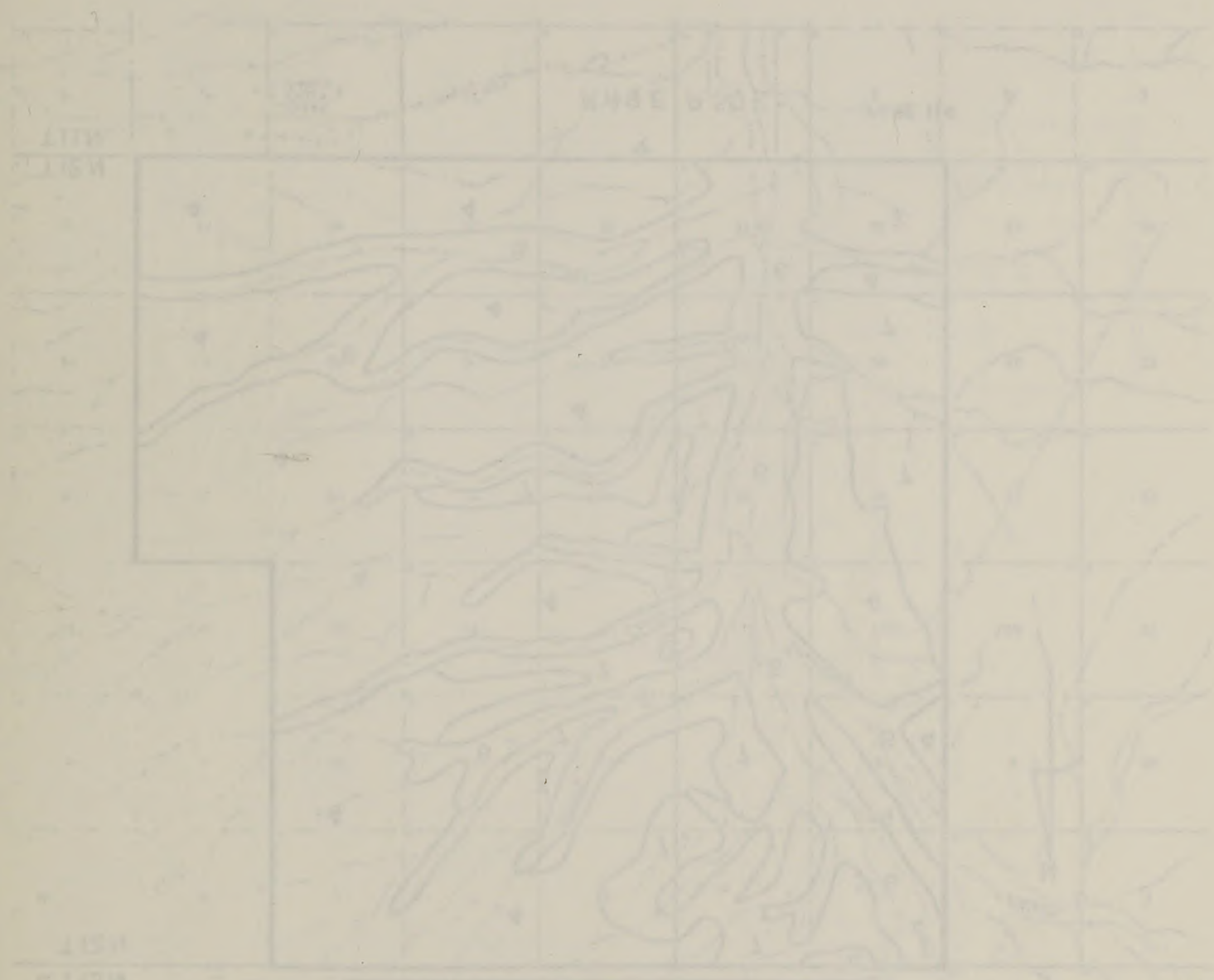

GENERAL SOIL MAP
STONE CABIN VALLEY - NORTH
Scale
0 .5 1 2 Miles
N
R 47 E
R 48 E
R 49 E
T 7 N
T 6 N
T 5 N
LONGSTREET RANCH
LONE TREE
Longstreet
Canyon
Willow
Bunch
Wash
Pinon Peak
PARALLEL
NORTH
Creek
PAGE 112


SOIL MAP
HUTTON-WATTLEY-NORTH
CAMP SOILS
GENERAL


R49E
R50E
T11N
T10N
T9N
T. 10 N.
T. 9 N.
BELMONT
Clover Creek
Big Canyon
2nd Creek
LEE FISH LAKE RANCH
Little Fish Lake
Cow Canyon
Hogback Canyon
Crescent Canyon
Cottonwood Canyon
Fourmile Flats
Sawtooth Ridge
Canyon
Valley
GENERAL SOIL MAP
LITTLE FISH LAKE VALLEY - SOUTH
0 5 1 2 Miles
Scale
PAGE 115
R 49½-E



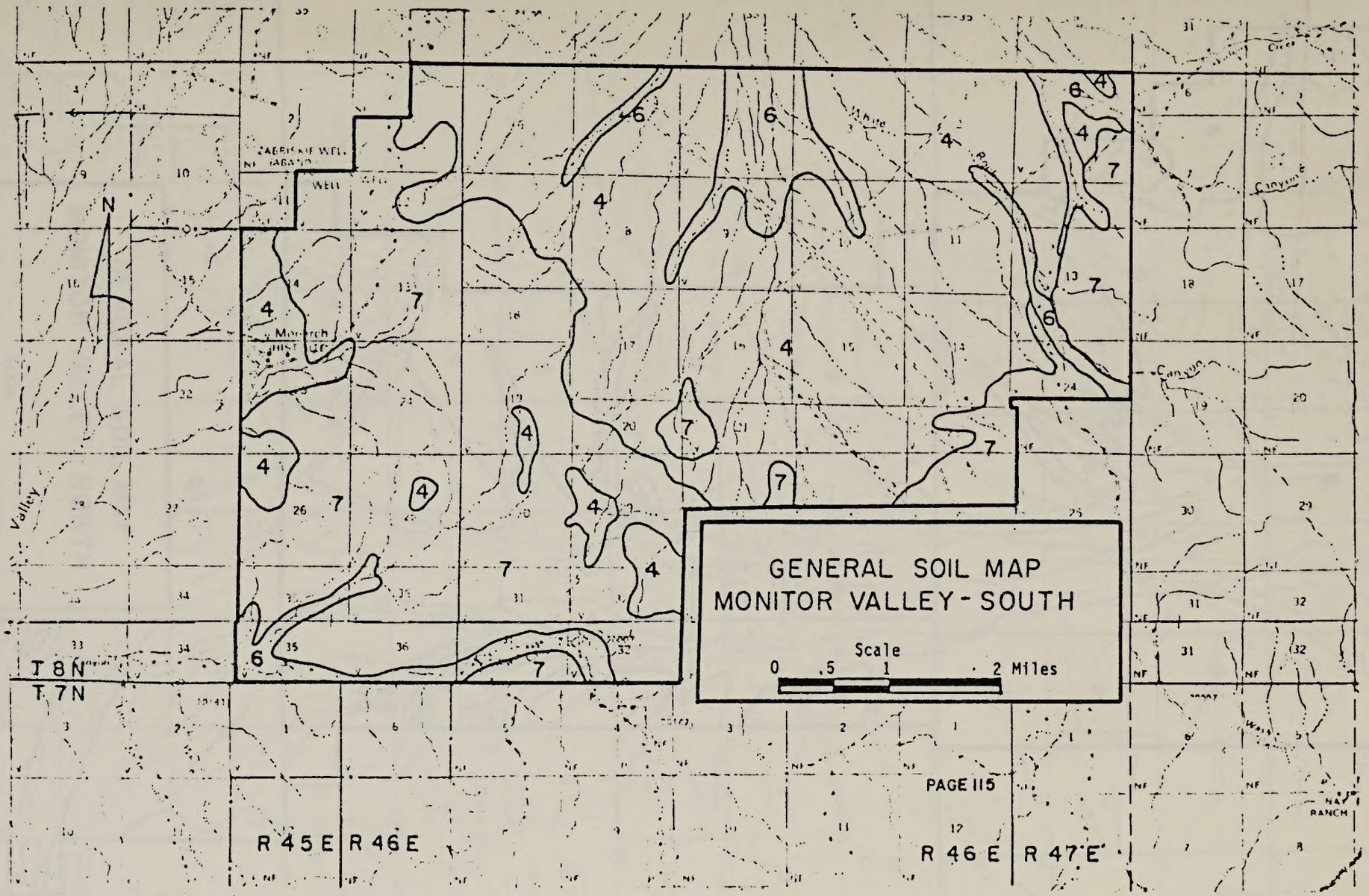

GENERAL SOIL MAP
LITTLE FISH LAKE VALLEY -
NORTH
0 .5 1 2 Miles
Scale
T13N
T12N
T 12 N
T12N
T11N
R49E
R50E
N
Wash
Creek
Creek
Creek
Creek
Creek
CLEAR CREEK RANCH
PAGE 114

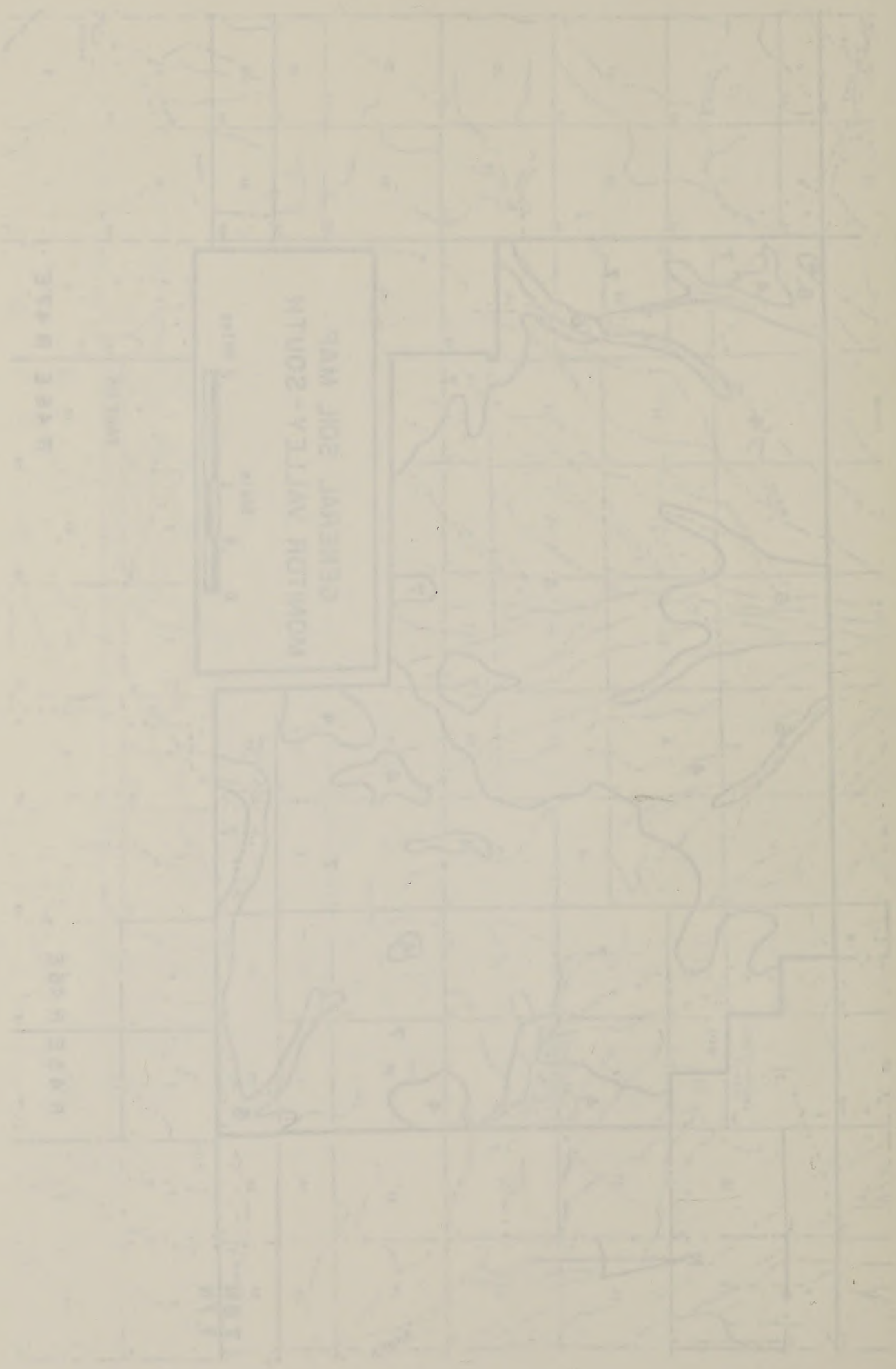


GENERAL ROAD MAP

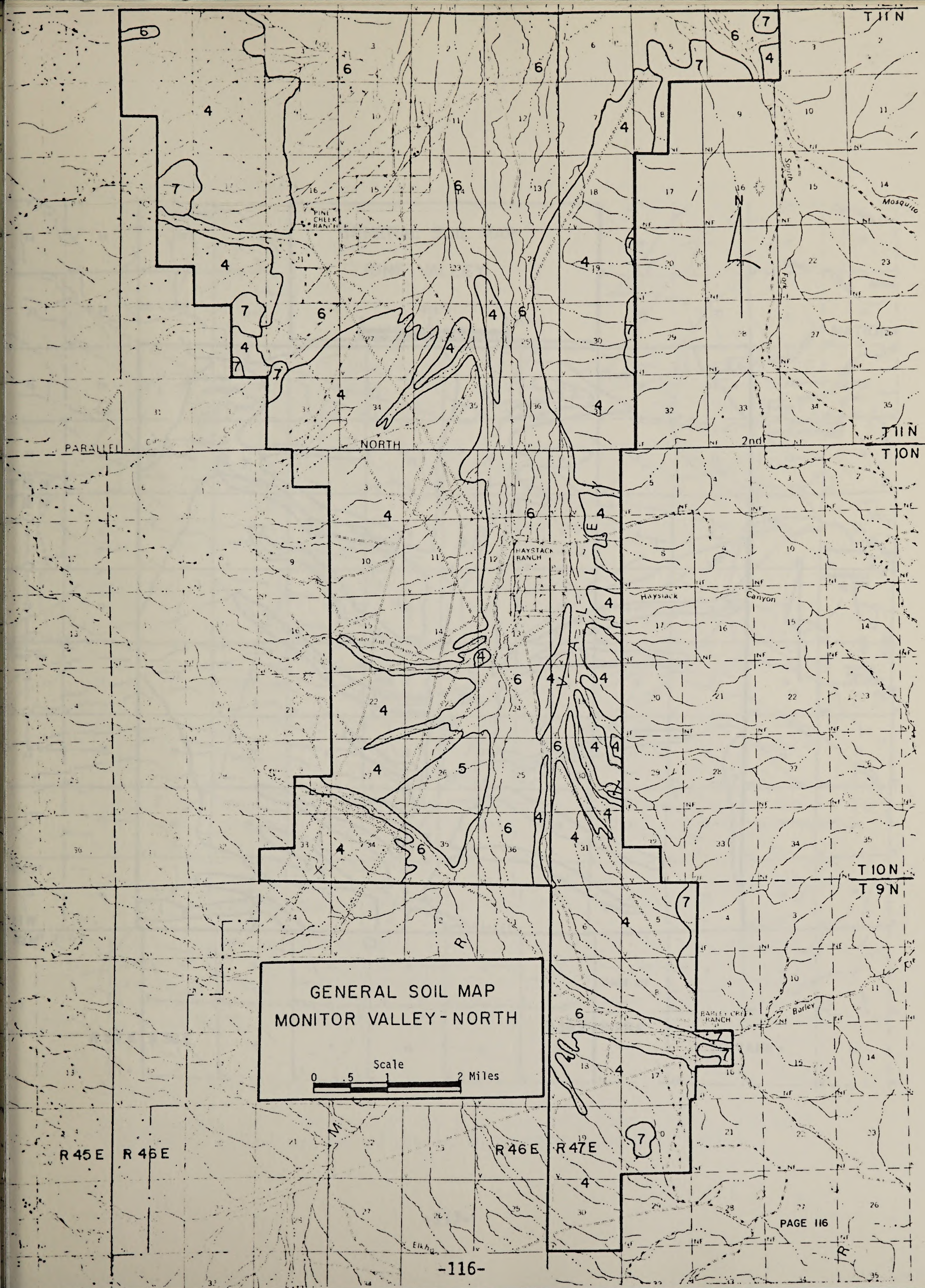
FLATTE, LISH LAKE VALLEY

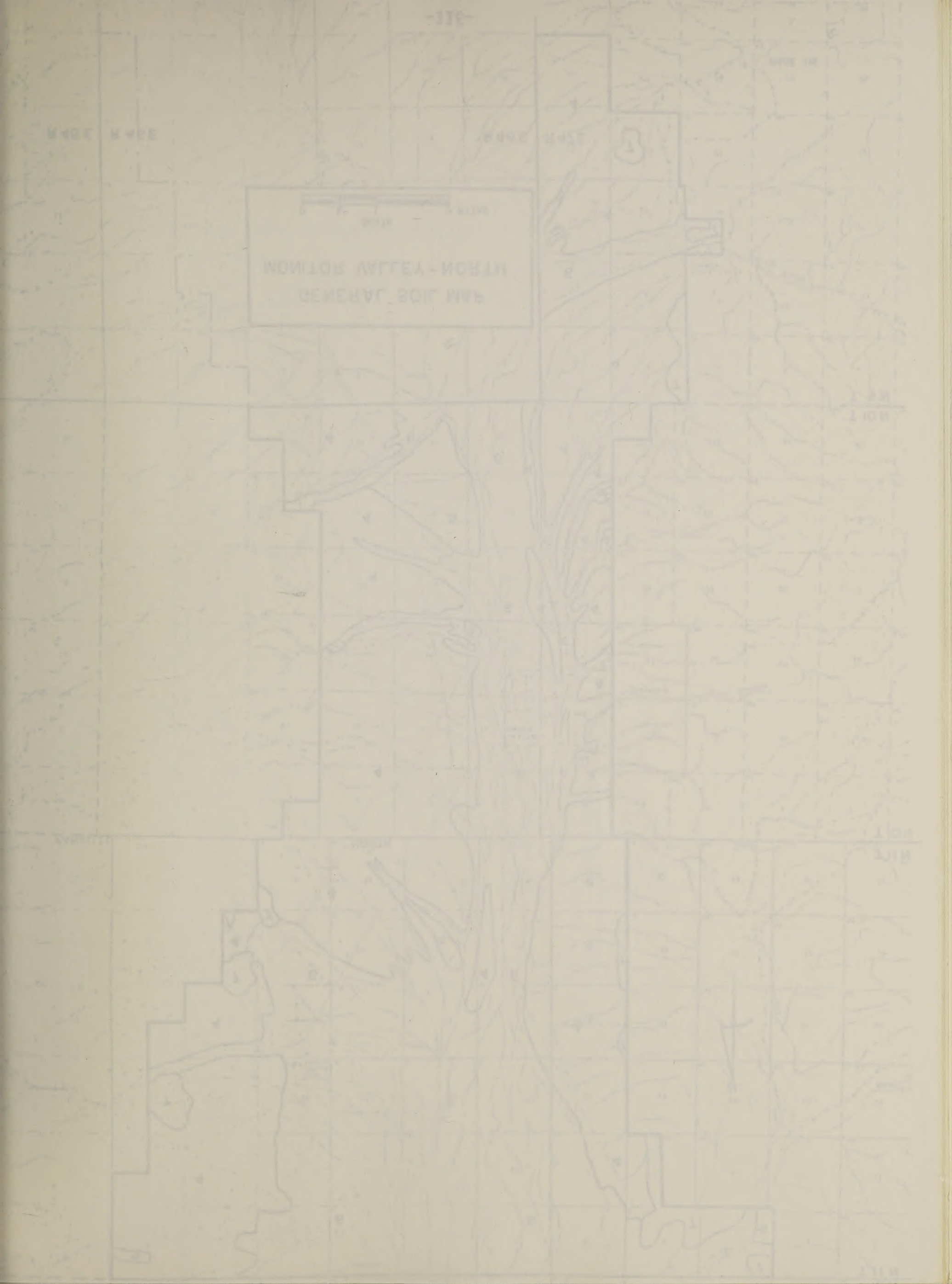
NORTH

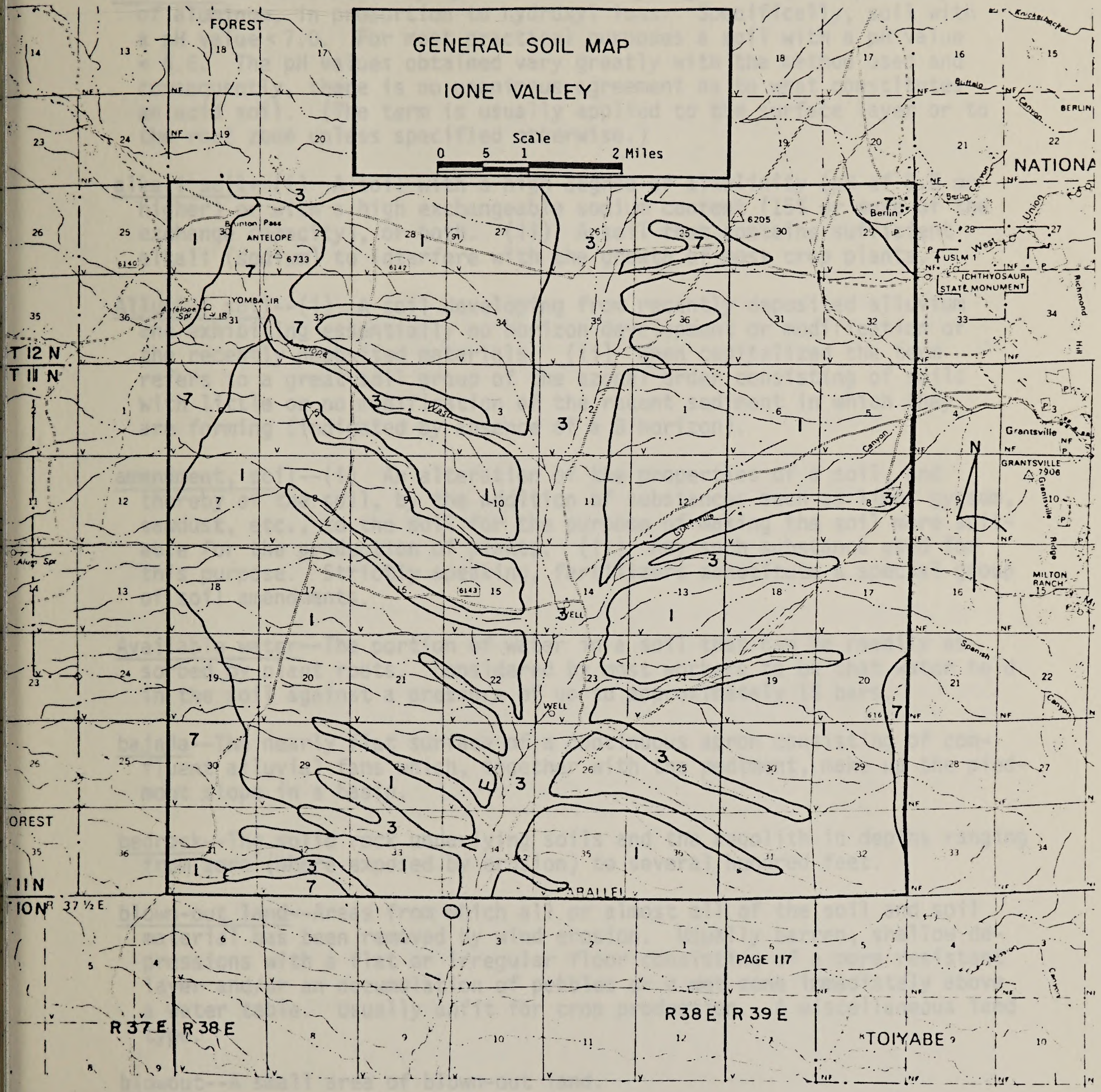

GENERAL SOIL MAP
MONITOR VALLEY - SOUTH
Scale
0 .5 1 2 Miles
T 8 N
T 7 N
R 45 E
R 46 E
R 47 E
N
Valley
Canyon
Ranch
PAGE 115

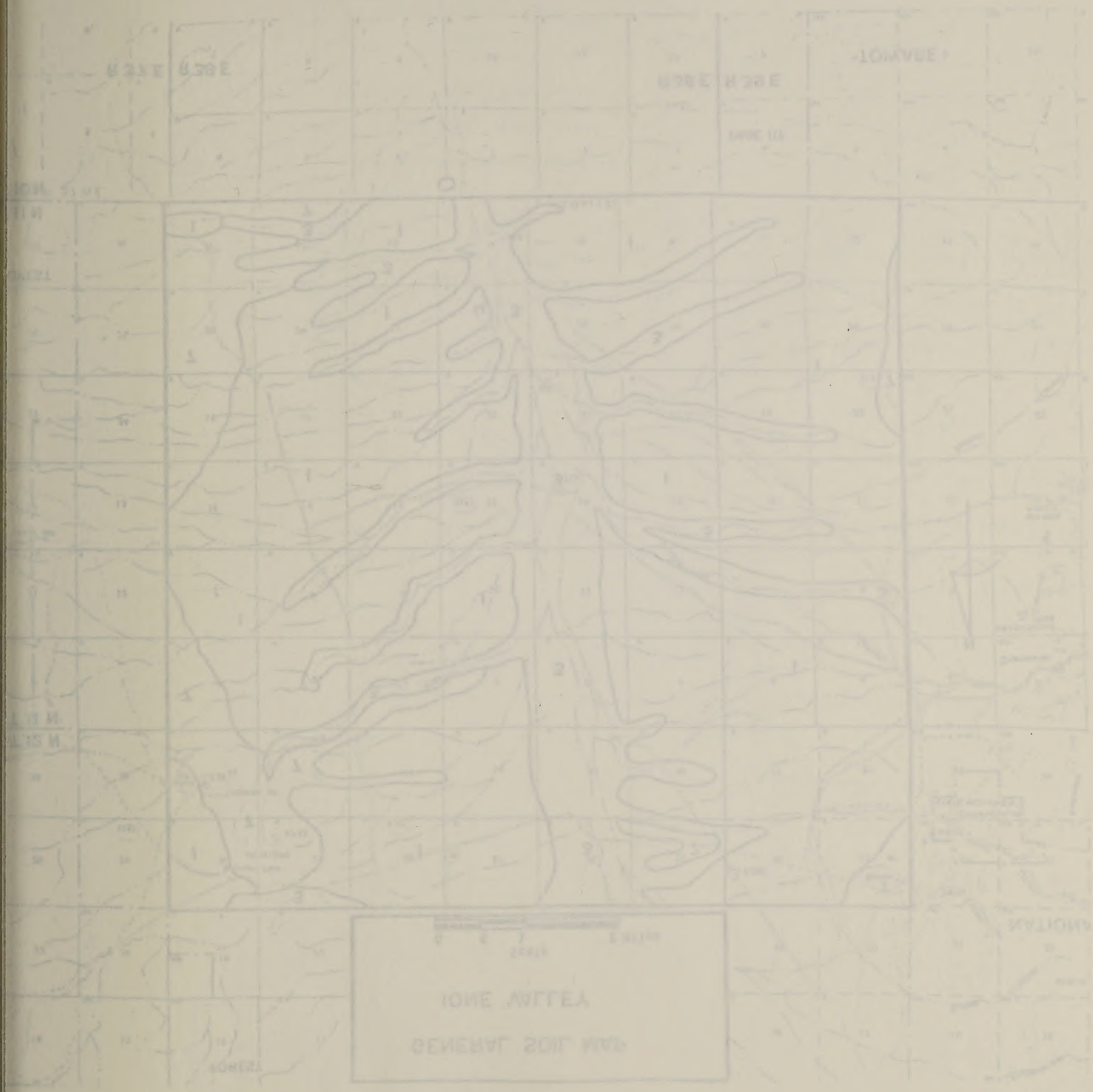

NEW MILFORD - SOUTH MILFORD
SOUTH MILFORD
Grassy Hill
Pond

GENERAL SOIL MAP
MONITOR VALLEY - NORTH






GENERAL SOIL MAP
IONE VALLEY
Scale
0 5 1 2 Miles
FOREST
ANTELOPE
6733
Buttington Pass
YOMBA IR
Antelope Spr
Antelope Wash
6205
Berlin
USLM 1
ICHTHYOSAUR STATE MONUMENT
Buffalo Canyon
West Union Canyon
Richmond
Grantsville
GRANTSVILLE
7906
Grantsville Ridge
MILTON RANCH
Spanish Canyon
Alkali Spr
WELL
PARALLEL
T 12 N
T 11 N
R 37 ½ E
R 37 E
R 38 E
R 39 E
TOIYABE
PAGE 117


IONE VALLEY
GENERAL SOIL MAP

GLOSSARY

acid soil--A soil with a preponderance of hydrogen ions, and probably of aluminum, in proportion to hydroxyl ions. Specifically, soil with a pH value < 7.0. For most practical purposes a soil with a pH value < 6.6. The pH values obtained vary greatly with the method used and consequently, there is no unanimous agreement as to what constitutes an acid soil. (The term is usually applied to the surface layer or to the root zone unless specified otherwise.)

alkali soil--(i) A soil with a high degree of alkalinity (pH of 8.5 or higher) or with a high exchangeable sodium content (15% or more of the exchange capacity), or both. (ii) A soil that contains sufficient alkali (sodium) to interfere with the growth of most crop plants.

Alluvial soil--(i) A soil developing from recently deposited alluvium and exhibiting essentially no horizon development or modification of the recently deposited materials. (ii) When capitalized the term refers to a great soil group of the azonal order consisting of soils with little or no modification of the recent sediment in which they are forming (indicated by absence of a B horizon).

amendment, soil--(i) An alteration of the properties of a soil, and thereby of the soil, by the addition of substances such as lime, gypsum, sawdust, etc., to the soil for the purpose of making the soil more suitable for the production of plants. (ii) Any such substance used for this purpose. Strictly speaking, fertilizers constitute a special group of soil amendments.

Available water--The portion of water in a soil that can be readily absorbed by plant roots. Considered by most workers to be that water held in the soil against a pressure of up to approximately 15 bars.

bajada--The nearly flat surface of a continuous apron consisting of confluent alluvial fans which, together with the pediment, make up the piedmont slope in a basin.

bedrock--The solid rock underlying soils and the regolith in depths ranging from zero (where exposed by erosion) to several hundred feet.

blown-out land--Areas from which all or almost all of the soil and soil material has been removed by wind erosion. Usually barren, shallow depressions with a flat or irregular floor consisting of a more resistant layer and/or an accumulation of pebbles or a wet zone immediately above a water table. Usually unfit for crop production. A miscellaneous land type.

blowout--A small area of blown-out land.

bulk density, soil--The mass of dry soil per unit bulk volume. The bulk volume is determined before drying to constant weight at 105°C.

bulk specific gravity--The ratio of the bulk density of a soil to the mass of unit volume of water.

buried soil--Soil covered by an alluvial, loessal, or other deposit, usually to a depth greater than the thickness of the solum.

calcareous soil--Soil containing sufficient calcium carbonate (often with magnesium carbonate) to effervesce visibly when treated with cold 0.1N hydrochloric acid.

cemented--Indurated; having a hard, brittle consistency because the particles are held together by cementing substances such as humus, calcium carbonate, or the oxides of silicon, iron, and aluminum. The hardness and brittleness persist even when wet.

chiseling--The breaking or shattering of compact soil or subsoil layers by use of a chisel.

chroma--The relative purity, strength, or saturation of a color; directly related to the dominance of the determining wavelength of the light and inversely related to grayness; one of the three variables of color. See Munsell color system, hue, and value, color.

coarse fragments--Rock or mineral particles > 2.0 mm in diameter.

coarse texture--The texture exhibited by sands, loamy sand, and sandy loams except very fine sandy loam. A soil containing large quantities of these textural classes (United States usage).

cobbles--See cobblestone.

cobblestone--Rounded or partially rounded rock or mineral fragments between 3 and 10 inches in diameter. See coarse fragments.

cobbly--Containing appreciable quantities of cobblestones. (Said of soil and of land. The term "angular cobbly" is used when the fragments are less rounded.) See coarse fragments.

colluvium--A deposit of rock fragments and soil material accumulated at the base of steep slopes as a result of gravitational action.

color--See Munsell color system.

complex, soil--See soil complex.

concretion--A local concentration of a chemical compound, such as calcium carbonate or iron oxide, in the form of a grain or nodule of varying size, shape, hardness, and color.

consistency--(i) The resistance of a material to deformation or rupture. (ii) The degree of cohesion or adhesion of the soil mass. Terms used for describing consistency ar various soil moisture contents are:

Wet Soil--nonsticky, slightly sticky, sticky, very sticky, nonplastic, slightly plastic, plastic, and very plastic.

Moist Soil--loose, very friable, friable, firm, very firm, and extremely firm.

Dry Soil--loose, soft, slightly hard, hard, very hard, and extremely hard.

Cementation--weakly cemented, strongly cemented, and indurated.

deposit--Material left in a new position by a natural transporting agent such as water, wind, ice, or gravity, or by the activity of man.

ecology--The science that deals with the interrelations of organisms and their environment.

effective precipitation--That portion of the total precipitation which becomes available for plant growth.

erode--To wear away or remove the land surface by wind, water, or other agents.

erodible--Susceptible to erosion. (Expressed by terms such as highly erodible, slightly erodible, etc.)

erosion--(i) The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep. (ii) Detachment and movement of soil or rock by water, wind, ice, or gravity. The following terms are used to describe different types of water erosion:

accelerated erosion--Erosion much more rapid than normal, natural, geological erosion, primarily as a result of the influence of the activities of man or, in some cases, or animals.

geological erosion--The normal or natural erosion caused by geological processes acting over long geologic periods and resulting in the wearing away of mountains, the building up of flood plains, coastal plains, etc. Synonymous with natural erosion.

gully erosion--The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths, ranging from 1 or 2 feet to as much as 75 to 100 feet.

natural erosion--Wearing away of the earth's surface by water, ice, or other natural agents under natural environmental conditions of climate, vegetation, etc., undisturbed by man. Synonymous with geological erosion.

normal erosion--The gradual erosion of land used by man which does not greatly exceed natural erosion. See natural erosion.

rill erosion--An erosion process in which numerous small channels of only several inches in depth are formed; occurs mainly on recently cultivated soils.

sheet erosion--The removal of a fairly uniform layer of soil from the land surface by runoff water.

splash erosion--The spattering of small soil particles caused by the impact of raindrops on very wet soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.

evapotranspiration--The combined loss of water from a given area, and during a specified period of time, by evaporation from the soil surface and by transpiration from plants.

family, soil--In soil classification one of the categories intermediate between the great soil group and the soil series.

fertility, soil--The status of a soil with respect to the amount and availability to plants of elements necessary for plant growth.

genetic--Resulting from, or produced by, soil-forming processes; for example, a genetic soil profile or a genetic horizon.

gilgai--The microrelief of soils produced by expansion and contraction with changes in moisture. Found in soils that contain large amounts of clay which swells and shrinks considerably with wetting and drying. Usually a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel to the direction of the slope.

gully--A channel resulting from erosion and caused by the concentrated but intermittent flow of water usually during and immediately following heavy rains. Deep enough to interfere with, and not to be obliterated by, normal tillage operations.

hue--One of the three variables of color. It is caused by light of certain wavelengths and changes with the wavelength. See Munsell color system, chroma, and value, color.

igneous rock--Rock formed from the cooling and solidification of magma, and that has not been changed appreciably since its formation.

illuvial horizon--A soil layer or horizon in which material carried from an overlying layer has been precipitated from solution or deposited from suspension. The layer of accumulation.

lacustrine deposit--Material deposited in lake water and later exposed either by lowering of the water level or by the elevation of the land.

miscellaneous land type--A mapping unit for areas of land that have little or no natural soil, that are too nearly inaccessible for orderly examination, or that for any reason it is not feasible to classify the soil.

Munsell color system--A color designation system that specifies the relative degrees of the three simple variables of color: hue, value, and chroma. For example: 10YR 6/4 is a color (of soil) with a hue = 10YR, value = 6, and chroma = 4. These notations can be translated into several systems of color names as desired. See chroma, hue, and value, color.

parent material--The unconsolidated and more or less chemically weathered mineral or organic matter from which the solum of soils is developed by pedogenic processes.

permeability, soil--(i) The ease with which gases, liquids, or plant roots penetrate or pass through a bulk mass of soil or a layer of soil. Since different soil horizons vary in permeability, the particular horizon under question should be designated. (ii) The property of a porous medium itself that relates to the ease with which gases, liquids, or other substances can pass through it. Previously, frequently considered the "k" in Darcy's law. The "K" in intrinsic permeability.

pH, soil--The negative logarithm of the hydrogen-ion activity of a soil. The degree of acidity (or alkalinity) of a soil as determined by means of a glass, quinhydrone, or other suitable electrode or indicator at a specified moisture content or soil-water ratio, and expressed in terms of the pH scale.

phase, soil--A subdivision of a soil type or other unit of classification having characteristics that affect the use and management of the soil but which do not vary sufficiently to differentiate it as a separate type. A variation in a property or characteristic such as degree of slope, degree of erosion, content of stones, etc.

porosity--The volume percentage of the total bulk not occupied by solid particles.

profile, soil--A vertical section of the soil through all its horizons and extending into the parent material.

reaction, soil--The degree of acidity or alkalinity of a soil, usually expressed as a pH value. Descriptive terms commonly associated with certain ranges in pH are: extremely acid, <4.5; very strongly acid, 4.5 - 5.0; strongly acid, 5.1 - 5.5; moderately acid, 5.6 - 6.0; slightly acid, 6.1 - 6.5; neutral, 6.6 - 7.3; slightly alkaline, 7.4 - 7.8; moderately alkaline, 7.9 - 8.4; strongly alkaline, 8.5 - 9.0; and very strongly alkaline, >9.1.

residual soil--(Obsolete) A soil formed from, or resting on, consolidated rock of the same kind as that from which it was formed, and in the same location.

rock land--Areas containing frequent rock outcrops and shallow soils. Rock outcrops usually occupy from 25 to 90% of the area. A miscellaneous land type.

runoff--That portion of the precipitation on an area which is discharged from the area through stream channels. That which is lost without entering the soil is called surface runoff and that which enters the soil before reaching the stream is called ground water runoff, or seepage flow from ground water.

(In soil science "runoff" usually refers to the water lost by surface flow; in geology and hydraulics "runoff" usually includes both surface and subsurface flow.)

soil--(i) The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants. (ii) The unconsolidated mineral matter on the surface of the earth that has been subjected to and influenced by genetic and environmental factors of: parent material, climate (including moisture and temperature effects), macro- and microorganisms, and topography, all acting over a period of time and producing a product--soil--that differs from the material from which it is derived in many physical, chemical, biological and morphological properties, and characteristics.

soil association--(i) A group of defined and named taxonomic soil units occurring together in an individual and characteristic pattern over a geographic region, comparable to plant associations in many ways. (Sometimes called "natural land type.") (ii) A mapping unit used on general soil maps, in which two or more defined taxonomic units occurring together in a characteristic pattern are combined because the scale of the map or the purpose for which it is being made does not require delineation of the individual soils.

soil complex--A mapping unit used in detailed soil surveys where two or more defined taxonomic units are so intimately intermixed geographically that it is undesirable or impractical, because of the scale being used, to separate them. A more intimate mixing of smaller areas of individual taxonomic units than that described under soil association.

soil genesis--(i) The mode of origin of the soil with special reference to the processes or soil-forming factors responsible for the development of the solum, or true soil, from the unconsolidated parent material. (ii) A division of soil science concerned with soil genesis (i).

soil map--A map showing the distribution of soil types or other soil mapping units in relation to the prominent physical and cultural features of the earth's surface.

soil pores--That part of the bulk volume of soil not occupied by soil particles; interstices; voids.

soil series--The basic unit of soil classification being a subdivision of a family and consisting of soils which are essentially alike in all major profile characteristics except the texture of the A horizon.

soil survey--The systematic examination, description, classification, and mapping of soils in an area. Soil surveys are classified according to the kind and intensity of field examination.

soil texture--The relative proportions of the various soil separates in a soil as described by classes of soil texture. The textural classes may be modified by the addition of suitable adjectives when coarse fragments are present in substantial amounts; for example, "stony silt loam," or "silt loam, stony phase." (For other modifications, see coarse fragments.) The

sand, loamy sand, and sandy loam are further subdivided on the basis of the proportions of the various sand separates present. The limits of the various classes are as follows:

sand--Soil material that contains 85% or more of sand; percentage of silt, plus 1.5 times the percentage of clay, shall not exceed 15.

loamy sand--Soil material that contains at the upper limit 85 to 90% sand, and the percentage of silt plus 1.5 times the percentage of clay is not less than 15; at the lower limit it contains not less than 70 to 85% sand, and the percentage of silt plus twice the percentage of clay does not exceed 30.

sandy loam--Soil material that contains either 20% clay or less, and the percentage of silt plus twice the percentage of clay exceeds 30, and 52% or more sand; or < 7% clay, < 50% silt, and between 43% and 52% sand.

loam--Soil material that contains 7 to 27% clay, 28 to 50% silt, and < 52% sand.

silt loam--Soil material that contains 50% or more silt and 12 to 27% clay (or) 50 to 80% silt and < 12% clay.

silt--Soil material that contains 80% or more silt and < 12% clay.

Sandy clay loam--Soil material that contains 20 to 35% clay, ≤ 28% silt, and 45% or more sand.

clay loam--Soil material that contains 27 to 40% clay and 20 to 45% sand.

silty clay loam--Soil material that contains 27 to 40% clay and < 20% sand.

sandy clay--Soil material that contains 35% or more clay and 45% or more sand.

silty clay--Soil material that contains 40% or more clay and 40% or more silt.

clay--Soil material that contains 40% or more clay, < 45% sand, and < 40% silt

soil type--(i) The lowest unit in the natural system of soil classification; a subdivision of a soil series and consisting of or describing soils that are alike in all characteristics including the texture of the A horizon. (ii) In Europe, roughly equivalent to a great soil group.

stones--Rock fragments > 10 inches in diameter if rounded, and > 15 inches along the greater axis if flat. See coarse fragments.

stoniness--The relative proportion of stones in or on the soil. Used in classification of soils. See coarse fragments.

stony--Containing sufficient stones to interfere with or to prevent tillage. To be classified as stony, > 0.01% of the surface of the soil must be covered with stones. Used to modify soil class, as stony clay loam or clay loam, stony phase. See coarse fragments.

stony land--Areas containing sufficient stones to make the use of machinery impractical; usually 15 to 90% of the surface is covered with stones. A miscellaneous land type. See stoniness.

topsoil--(i) The layer of soil moved in cultivation. See surface soil. (ii) The A horizon. (iii) The A1 horizon. (iv) Presumably fertile soil material used to topdress roadbanks, gardens, and lawns.

value, color--The relative lightness or intensity of color and approximately a function of the square root of the total amount of light. One of the three variables of color. See Munsell color system, hue, and chroma.

water table--The upper surface of ground water or that level below which the soil is saturated with water; locus of points in soil water at which the hydraulic pressure is equal to atmospheric pressure.

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APPENDIX

A

DETAILED SERIES DESCRIPTIONS
(IN ALPHABETICAL ORDER)

(3853) Alcorn Series

The Alcorn series consists of deep, dark brown to yellow, sandy well-drained soils that have developed on valley-filling materials. They occur mainly on bajadas and fans where slopes are nearly level to moderately sloping and precipitation is 6 to 10 inches.

Taxonomic Class: Coarse-loamy, mixed, mesic, Typic Camborthids.

Typical Pedon: Alcorn loamy sand. (Colors are for dry soil unless otherwise noted.)

A1-0 to 8 inches; pale brown (10YR 6/3) loamy sand, brown to dark brown (10YR 4/3) moist; weak fine granular structure; loose, very friable, nonsticky, nonplastic; moderately alkaline (pH 8.0); clear wavy boundary. (4 to 12 inches thick).

B2-8 to 20 inches; yellow (10YR 7/6) sandy loam, yellowish brown (10YR 5/6) moist; massive; soft, very friable, slightly sticky, nonplastic; moderately alkaline (pH 8.0); gradual wavy boundary. (8 to 20 inches thick).

C1-20 to 34 inches; yellow (10YR 8/6) sandy loam, brownish yellow (10YR 6/6) moist; massive; soft, very friable, slightly sticky, nonplastic; moderately to strongly alkaline (pH 8.4); gradual wavy boundary. (12 to 16 inches thick).

C2-34 to 60 inches; yellow (10YR 7/6) gravelly loamy sand, yellowish brown (10YR 5/6) moist; singlegrain; soft, very friable, nonsticky, nonplastic; moderately to strongly alkaline (pH 8.4). (20 to 24 inches thick).

Type Location: Nye County, Nevada. SW¼ NE¼ Section 6, T. 3 N., R. 48 E. (Stone Cabin south, photo 3-229, stop F.)

(3860) Bereniston Series 1/

The Berensiton series consists of deep, well-drained, loamy soils derived from mixed igneous and sedimentary sources. They occur in alluvial bottoms with nearly level to gentle slopes in areas receiving 8 to 12 inches precipitation.

Taxonomic Class: Fine-loamy, mixed (calcareous) frigid, Xeric Torrorthents.1/

Typical Pedon: Bereniston fine sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 4 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8);clear smooth boundary. (2 to 6 inches thick).

C1-4 to 26 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; massive, stratified; hard, firm, slightly sticky, slightly plastic; many fine and very fine roots; common fine and medium tubular pores; violently effervescent; strongly alkaline (pH 8.8);clear wavy boundary. (15 to 30 inches thick).

C2-26 to 33 inches; grayish brown (10YR 5/2) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, slightly sticky, nonplastic; common fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.2);gradual wavy boundary. (3 to 10 inches thick).

1/ Taxadjunct: series is a taxadjunct due primarily to ranging slightly outside the color value range and in its geographic setting.

C3-33 to 40 inches; very pale brown (10YR 7/3) gravelly sand, yellowish brown (10YR 5/4) moist; massive; hard, very friable, nonsticky, nonplastic; many fine and very fine interstitial pores; moderately alkaline (pH 8.2). (3 to 10 inches thick).

Type Location: Nye County, Nevada. NE Corner SE¼ Section 1, T. 11 N., R. 46 E. (Monitor Valley north, stop 0.)

(3837) Cliffdown Series

The Cliffdown series consists of deep, very pale brown, gravelly sandy loams that are well-drained. They occur on gently to moderately sloping alluvial fans, terraces and bajadas where precipitation is 6 to 12 inches.

Taxonomic Class: Loamy-skeletal, mixed (calcareous), mesic, Typic Torriorthents.

Typical Pedon: Cliffdown gravelly sandy loam. (Colors are for dry soil unless otherwise noted.)

A1 - 0 to 3 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 4 inches thick).

C1 - 3 to 18 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.4) clear wavy boundary. (15 to 20 inches thick).

IIC2 - 18 to 40 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; loose, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.4). (20 to greater than 40 inches thick).

Type Location: Nye County, Nevada. NW¼ SW¼ Section 22, T. 7 N., R. 50 E., (Hot Creek Valley).

(3835) Deerlodge Series

The Deerlodge series consists of moderately deep, well-drained loamy soils derived from mixed igneous sources. They occur on moderately sloping alluvial fans in areas receiving 6 to 10 inches of precipitation.

Taxonomic Class: Fine-loamy, mixed, mesic, Xerollic Durargids.

Typical Pedon: Deerlodge sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A11-0 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 4 inches thick).

A12-4 to 5 inches light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; weak fine platy structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine very fine vesicular pores; mildly alkaline (pH 7.8): abrupt smooth boundary. (1 to 4 inches thick).

B2t-5 to 12 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium subangular blocky structure; slightly hard, friable, sticky, plastic; many fine, medium and coarse roots; many fine and very fine interstitial pores; many thin clay films on ped surfaces and in pores; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 12 inches thick).

B2tca-12 to 24 inches; very pale brown (10YR 7/4) heavy sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; common fine and very fine roots; many fine and very fine interstitial pores; few thin

clay films on ped faces and in pores; strongly alkaline (pH 8.7); abrupt, smooth boundary. (10 to 15 inches thick).

Ccasim-24 to 30 inches plus; very pale brown (10YR 7/3) hard, indurated duripan; brown (10YR 4/3) moist; calcareous; strongly alkaline (pH 8.7).

Type Location: Nye County, Nevada. NW¼ NW¼ Section 10, T. 4 N., R. 47 E. (Stone Cabin, south, photo 3-242, stop H.)

(3851) Dun Glen Series

The Dun Glen series consists of deep, very pale brown to dark yellowish brown, sandy, well-drained soils that have developed on valley-filling materials. They occur mainly on the lower parts of bajadas or low terraces where slopes are nearly level to gently sloping and precipitation is 6 to 8 inches.

Taxonomic Class: Coarse-loamy, mixed, mesic, Typic Camborthids.

Typical Pedon: Dun Glen sandy loam. (Colors are for dry soil unless otherwise noted.)

A1-0 to 4 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; moderate fine platy and granular structure; slightly hard, very friable, nonsticky, nonplastic; mildly alkaline (pH 7.8); clear wavy boundary. (2 to 6 inches thick).

B2-4 to 17 inches; pale brown (10YR 6/3) heavy sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky, slightly plastic; mildly alkaline (pH 7.8); gradual wavy boundary. (6 to 18 inches thick).

C1-17 to 40 inches; very pale brown (10YR 7/3) sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky, nonplastic; strongly alkaline (pH 8.8), calcareous. (15 to greater than 40 inches thick).

Type Location: Nye County, Nevada. NW¼ NW¼ Section 1, T. 4 N., R. 47 E. (Stone Cabin Valley south, photo 3-227, stop I.)

(3834) Fang Series

The Fang series consists of deep, brown, sandy soils. They are well-drained and are derived mainly from reworked old valley fill material. They occur in narrow and broad stream bottom positions on nearly level to moderately sloping areas where precipitation is 6 to 8 inches.

Taxonomic Class: Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents.

Typical Pedon: Fang loamy fine sand, rangeland. (Colors are for dry soil unless otherwise noted.)

A1-0 to 4 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 4/3) moist; weak coarse platy to single grained, soft to loose, very friable, nonsticky, nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent; strongly calcareous (pH 8.8); clear smooth boundary. (2 to 6 inches thick).

C1-4 to 26 inches; light gray (10YR 7/2) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky, nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8);clear wavy boundary. (10 to 30 inches thick).

C3-26 to 40 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky, nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6). (10 to 30 inches thick).

Type Location: Nye County, Nevada. SE¼ NW¼ Section 6, T. 3 N., R. 48 E.(Stone Cabin Valley south, photo 3-224.)

(3858) Haploxerollic Durorthid Soil

This Unnamed soil consists of deep, well-drained, loamy soils derived from mixed igneous and sedimentary sources. They occur on nearly level to gently sloping old alluvial fans in areas receiving 8 to 12 inches of precipitation.

Taxonomic Class: Loamy, mixed, frigid, shallow, Haploxerollic Durorthids.

Typical Pedon: Haploxerollic Durorthid sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 6 inches; light brownish gray (10YR 6/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse platy and moderate fine granular structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine vesicular and interstitial pores; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 8 inches thick).

B2-6 to 16 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; mildly alkaline (pH 8.0); clear wavy boundary. (8 to 15 inches thick).

C1si-16 to 22 inches; very pale brown (10YR 7/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; weakly cemented duripan with 30 percent medium to coarse durinodes; hard, firm, nonsticky, nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 12 inches thick).

C2sica-22 to 40 inches; white (10YR 8/2) gravelly sandy loam, brown (10YR 5/3) moist; massive; weakly cemented duripan with 30 percent medium to coarse durinodes; very hard, brittle, nonsticky, nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); cementation decrease gradually below a depth of about 30 inches. (20 to greater than 40 inches thick).

Type Location: Nye County, Nevada. SW¼ SW¼ Section 25, T. 11 N., R. 46 E. (Monitor Valley north, stop M.)

Range in Characteristics: Coarse fragment content varies within the solum and substrata. The surface typically has 5 to 15 percent gravel and may or may not have a thin veneer of gravel covering 20 to 50 percent of the surface area. The cambic horizon (B2) usually has 5 to 15 percent gravel. The substratum is weakly cemented and typically has 15 to 35 percent gravel; however, individual thin strata may be nearly free of gravel or contain 50 to 90 percent. The A horizon has values of 6 or 7 dry and 4 to 5 moist with chromas of 2 or 3. The B2 horizon has values of 6 or 7 dry and 4 or 5 moist with chromas of 3 or 4. The substratum typically has a Cca horizon which has color values one value higher than the B2 with some white lime mottles. The lower substratum has colors similar to the B2 horizon. Texture of the A horizon includes loamy sand, sandy loam, fine sandy loam and loam and may or may not be gravelly. The B2 horizon is sandy loam or gravelly sandy loam. The substratum is stratified but averages sandy loam in texture.

Geographic Setting: The Haploxerollic Durorthid soils occur on nearly level to moderately sloping, old alluvial fans in valley-filling sediments, in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients range from 0 to 8 percent.

The climate is semiarid with cold winters and cool summers. The mean annual precipiation is between 8 and 12 inches; the mean annual air temperature is 40 to 45°F. The frost-free season is 80 to 100 days.

Geographically Associated Soils: The Haploxerollic Durorthid soils are associated with soils of the Olson, Ratto, and Shipley series. Both the Olson and Ratto have indurated duripans at shallow depths. The Shipley soils lack a cambic horizon.

Drainage and Permeability: Well-drained; permeability is moderately rapid.

Use and Vegetation: Mainly grazing, watershed, wildlife habitat, and recreation. Native vegetation consists of big sagebrush, Indian ricegrass and squirreltail.

(3862) Hutton Series [1/]

The Hutton series consists of deep, poorly drained, dark colored, fine textured alluvial soils derived from mixed igneous and sedimentary sources. They occur on nearly level to bottomlands with high water tables in areas receiving 8 to 12 inches of precipitation.

Taxonomic Class: Fine, montmorillonitic frigid, Typic Haplaquolls. [1/]

Typical Pedon: Hutton silty clay loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 7 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/3) moist; moderate fine platy and strong fine granular structure; slightly hard, friable, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.4); clear smooth boundary. (4 to 10 inches thick).

B2-7 to 36 inches; gray (10YR 6/1) silty clay, dark gray (10YR 4/1) moist; strong fine angular blocky structure; hard, firm, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (20 to 35 inches thick).

Cca-36 to 60 inches; white (10YR 8/1) silty clay, light brownish gray (10YR 6/2) moist; moderate fine angular blocky structure; hard, friable, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent, lime is disseminated; strongly alkaline (pH 8.9). (20 to greater than 30 inches thick).

Type Location: Nye County, Nevada. SW¼ SW¼ Section 2, T. 10 N., R. 49 E. (Little Fish Lake Valley south, photo 3-108, stop Q.)

1/ Taxadjunct; series is a taxadjunct due primarily to the presence of lime and reaction.

(3854) Indian Creek Series

The Indian Creek series consists of shallow, well-drained, loamy soils derived from mixed sedimentary and igneous sources. They occur on gently sloping to moderately steep old alluvial fans in areas receiving 6 to 10 inches of precipitation.

Taxonomic Class: Clayey, montmorillonitic, mesic, shallow, Xerollic Duragids.

Typical Pedon: Indian Creek sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 4 inches; light gray (10YR 7/2) sandy loam, grayish brown (10YR 5/2) moist; weak coarse platy structure; soft, very friable, non-sticky,nonplastic; few to common fine and very fine roots; many fine vesicular pores; mildly alkaline (pH 7.8); clear smooth boundary. 5 inches thick).

B21t-4 to 9 inches; light yellowish brown (10YR 6/4) sandy clay, yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; slightly hard, firm, sticky, plastic; common to many fine and medium roots; common fine and very fine tubular and interstitial pores; continuous thick clay films in pores and on ped faces; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 8 inches thick).

B22tca-9 to 12 inches; very pale brown (10YR 7/4) sandy clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky, slightly plastic; common to many fine and medium roots; common fine and very fine tubular and interstitial pores; common thin clay films on ped faces and in pores; effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (2 to 4 inches thick)

Csicam-12 to 20 inches plus; very pale brown (10YR 8/4) platy, indurated

duripan, (10YR 7/4) moist; strongly alkaline (pH 8.6); strongly effervescent; many fine and very fine roots between plates. (A few inches to several inches thick).

Type Location: Nye County, Nevada. SE¼ SW¼ Section 2, T. 6 N., R. 48 E. (Stone Cabin Valley north, photo 3-176, stop E.)

(3856) Olson Series

The Olson series consists of shallow, well-drained, loamy soils derived from mixed igneous and sedimentary sources. They occur on gently sloping to moderately steep, old alluvial fans in areas receiving 8 to 12 inches of precipitation.

Taxonomic Class: Loamy, mixed, frigid, shallow, Xerollic Durargids.

Typical Pedon: Olson sandy clay loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A11-0 to 2 inches; light gray (10YR 7/2) light sandy clay loam, brown (10YR 4/3) moist; moderate fine platy structure; soft, very friable, slightly sticky, slightly plastic; many fine and very fine roots; many fine and very fine vesicular pores; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 4 inches thick).

A12-2 to 4 inches; brown (10YR 5/3) light sandy clay loam, brown (10YR 4/3) moist; moderate fine granular structure, slightly hard, friable, slightly sticky, slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; mildly alkaline (pH 8.0); clear smooth boundary. (0 to 3 inches thick).

B2t-4 to 12 inches; light yellowish brown (10YR 6/4) sandy clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; many thick clay films on ped surfaces and in pores; mildly alkaline (pH 8.0); clear wavy boundary. (6 to 10 inches thick).

B3-12 to 16 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, slightly sticky, slightly plastic; many fine and very fine roots; many fine and very

fine interstitial pores; mildly alkaline (pH 8.0); clear wavy boundary. (3 to 8 inches thick).

Csim-16 to 19 inches plus; hard indurated silica duripan, non-calcareous in the upper part.

Type Location: Nye County, Nevada. SW¼ SW¼ Section 17, T. 8 N., R. 46 E. (Monitor Valley south, photo 2-62, stop K.)

(3839) Puddle Series

The Puddle series consists of deep, well-drained, limey, moderately coarse-textured soils, from mixed sedimentary and igneous sources. They occur on gently to moderately sloping, low fans adjacent to drainageways in areas receiving 6 to 10 inches precipitation.

Taxonomic Class: Coarse-loamy, carbonatic, mesic, Typic Calciorthids.

Typical Pedon: Puddle gravelly sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 2 inches; light gray (10YR 7/2) gravelly sandy loam, light brownish gray (10YR 6/3) moist; weak fine platy and moderate fine granular structure; soft, very friable, nonsticky, nonplastic; many fine and very fine interstitial pores; violently effervescent, moderately alkaline (pH 8.4); clear smooth boundary. (1 to 4 inches thick).

AC-2 to 7 inches; very pale brown (10YR 7/3) gravelly sandy loam, brown (10YR 5/3) moist; single-grained or massive; soft, very friable, nonsticky, nonplastic; violently effervescent; moderately alklaine (pH 8.4); clear wavy boundary. (3 to 8 inches thick).

C1ca-7 to 17 inches; very pale brown (10YR 8/3) gravelly sandy loam, (10YR 7/3) moist; massive; soft, very friable, nonsticky, nonplastic; violently effervescent with disseminated lime and segregated lime as many hard $CaCO_3$ concretions 2mm to 2 inches in diameter; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 14 inches thick).

C2ca-17 to 40 inches; very pale brown (10YR 8/3) gravelly loam, (10YR 7/3) moist; massive; soft, very friable, nonsticky, nonplastic; violently effervescent with desseminated lime and segregated lime as many hard $CaCO_3$ concretions 2 mm to 2 inches in diameter; strongly alkaline (pH 8.6). (24 to greater than 40 inches thick).

Type Location: Nye County, Nevada. SE¼ SE¼ Section 23 T. 7 N., R. 50 E. (Hot Creek Valley south, photo 3-18, stop c.)

(3857) Ratto Series

The Ratto series consists of shallow, well-drained, loamy soils derived from mixed igneous and sedimentary sources. They occur on gently to strongly sloping old alluvial fans in areas receiving 8 to 12 inches of precipitation.

Taxonomic Class: Clayey, montmorillonitic, frigid, shallow, Xerollic Durargids.

Typical Pedon: Ratto gravelly sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 4 inches; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 4/3) moist; weak fine platy and weak fine granular structure; soft, very friable, nonsticky, nonplastic, many fine and very fine roots; many fine and very fine interstitial pores; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 6 inches thick).

B2t-4 to 11 inches; very pale brown (10YR 7/3) sandy clay, brown (10YR 4/3) moist; massive; hard, friable, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; mildly alkaline (pH 8.0); clear wavy boundary. (5 to 8 inches thick).

C1Ca-11 to 14 inches; very pale brown (10YR 7/3) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, nonsticky; nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; strongly effervescent, strongly alkaline (pH 8.6); abrupt wavy boundary. (2 to 6 inches thick).

C2sicam-14 to 17 inches plus; hard, platy, indurated duripan; calcareous. (A few inches to several inches thick).

Type Location: Nye County, Nevada. SW¼ SE¼ Section 6, T. 8 N., R. 46 E. (Monitor Valley south, photo 2-60.)

(3838) Saltair Series

The Saltair series consists of deep, poorly drained, saline, moderately fine textured alluvial soils from mixed sources. They occur in nearly level bottomlands in areas receiving 6 to 10 inches precipitation.

Taxonomic Class: Fine-silty, mixed, mesic, Typic Salorthids.

Typical Pedon: Saltair silt loam, rangeland. (Colors are for moist soil unless otherwise stated.)

Alsa-0 to 3 inches; pale brown (10YR 6/3) silt loam with white crust ¼ to ½ inch thick on the surface; weak, fine platy and weak fine granular structure; very friable, slightly sticky, slightly plastic; very saline; very strongly alkaline (pH 9.6); clear wavy boundary. (2 to 6 inches thick).

C1sa-3 to 12 inches; pale brown (10YR 6/3) heavy silt loam; massive; very friable, sticky, plastic; saline; strongly alkaline (pH 8.6); gradual wavy boundary. (6 to 12 inches thick).

C2-12 to 38 inches; brown (7.5YR 5/4) silty clay loam; massive; very friable, sticky, plastic; strongly alkaline (pH 8.6); gradual wavy boundary. (15 to 30 inches thick).

C3-38 to 48 inches; pale brown (10YR 6/3) silty clay loam; massive; friable, sticky, plastic; strongly alkaline (pH 8.6); (A few inches to several feet thick).

Type Location: Nye County, Nevada, SE¼ NE¼ Section 25, t. 7 N., R. 50 E. (Hot Creek Valley south, photo 3-18, stop D.)

(3859) Shipley Series

The Shipley series consists of deep, well-drained, loamy soils derived from alluvium from mixed sources. They occur in alluvial bottoms on nearly level to gently slopes in areas receiving 8 to 12 inches of precipitation.

Taxonomic Class: Coarse-loamy, mixed (calcareous), frigid, Xeric Torriorthents.

Typical Pedon: Shipley gravelly sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 4 inches; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 6 inches thick).

C1-4 to 16 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 4/3) moist; massive, stratified; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; effervescent, moderately alkaline (pH 8.4); clear smooth boundary. (8 to 20 inches thick).

C2-16 to 30 inches; pale brown (10YR 6/3) gravelly loamy very fine sand, brown (10YR 4/3) moist; massive, stratified; soft, friable, nonsticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 20 inches thick).

C3-30 to 33 inches; white (10YR 8/2) silt (looks like ash), very pale brown (10YR 6/2) moist; massive; soft, friable, nonsticky, nonplastic; many very fine interstitial pores; few roots; effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 8 inches thick).

C4-33 to 40 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive, stratified; soft, friable, nonsticky, nonplastic; few roots; many fine and very fine interstitial pores; effervescent; moderately alkaline (pH 8.4), (3 to 10 inches thick).

Type Location: Nye County, Nevada. SW¼ SW¼ Section 10, T. 11 N., R. 46 E. (Monitor Valley north, stop N.)

(3852) Spanel Series

The Spanel series consists of shallow, well-drained, loamy soils derived from mixed sedimentary and igneous sources. They occur on gently to moderately sloping, old alluvial fans in areas receiving 6 to 10 inches of precipitation.

Taxonomic Class: Loamy, mixed, mesic, shallow, Typic Durargids.

Typical Pedon: Spanel gravelly sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 4 inches; light gray (10YR 7/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse platy structure; soft, friable, slightly sticky, slightly plastic; few fine and very fine roots; many vesicular pores; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 4 inches thick).

B2t-4 to 8 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 8 inches thick).

Cca-8 to 12 inches; very pale brown (10YR 7/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky, nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; strongly alkaline (pH 8.6); violently effervescent; abrupt smooth boundary. (2 to 6 inches thick).

Ccasim-12 inches plus; hard, massive or coarse platy, indurated silica cemented duripan. Violently effervescent. (Several inches to several feet thick).

Type Location: Nye County, Nevada. SE¼ NW¼ Section 28, T. 12 N., R. 38 E. (Ione Valley, photo 3-24, stop R.)

(3850) Ursine Series

The Ursine series consists of shallow, very pale brown to yellowish brown, gravelly, well-drained soils that have developed on calcareous valley filling materials. They occur on bajadas and fans where landscapes are moderately sloping to moderately steep and precipitation is 6 to 8 inches.

Taxonomic Class: Loamy-skeletal, carbonatic, mesic, shallow, Xerollic Durorthids.

Typical Pedon: Ursine gravelly sandy loam. (Colors are for dry soil unless otherwise noted.)

A11-0 to 2 inches; very pale brown (10YR 7/3) gravelly sandy loam or loam, dark yellowish brown (10YR 4/4) moist; weak fine platy structure; soft, very friable, slightly sticky, slightly plastic; common medium roots; many fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 3 inches thick).

A12-2 to 4 inches; very pale brown (10YR 7/3) gravelly sandy loam or loam, brown (10YR 5/3) moist; moderate fine granular structure; soft, very friable, slightly sticky, slightly plastic; common fine and very fine roots; many fine interstitial pores; strongly efferevscent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 3 inches thick).

AC-4 to 12 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky, slightly plastic; many fine, very fine and medium roots; many fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 12 inches thick).

Cca-12 to 14 inches; very pale brown (10YR 8/3) very gravelly sandy loam, very pale brown (10YR 7/3) moist; massive; soft, very friable, nonsticky, nonplastic; many fine, very fine and medium roots; common fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (1 to 3 inches thick).

Ccasim-14 to 18 inches; white, extremely hard, indurated, calcareous, duripan; will not slake in acid; many matted roots on upper surface (A few inches to a few feet thick, typically about 2 feet thick).

Type Location: Nye County, Nevada. NW¼ SE¼ Section 20, T. 7 N., R. 50 E. (Hot Creek Valley, south, photo 3-63, stop A.)

(3861) Xerollic Haplargid Soil

This Unnamed soil consists of deep, well-drained, loamy soils derived from mixed igneous and sedimentary sources. They occur on gentle to moderately sloping old alluvial fans in areas receiving 8 to 12 inches of precipitation.

Taxonomic Class: Fine-loamy, mixed, frigid, Xerollic Haplargids.

Typical Pedon: Xerollic Haplargid sandy loam, rangeland. (Colors are for dry soil unless otherwise stated.)

A1-0 to 4 inches; light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; weak medium to coarse platy structure; soft, very friable, non-sticky, nonplastic; many fine and very fine roots; many fine and very fine vesicular pores; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 6 inches).

B1-4 to 6 inches; very pale brown (10YR 7/3) sandy clay loam, brown (10YR 5/3) moist; moderate fine granular structure; soft, very friable, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; mildly alkaline (pH 7.8); clear wavy boundary. (1 to 3 inches thick).

B2t-6 to 18 inches; very pale brown (10YR 7/3) heavy sandy clay loam, brown (10YR 4/3) moist; strong fine to medium angular blocky structure; hard, friable, sticky, plastic; many fine and very fine roots; many fine and very fine interstitial pores; continuous thick clay films on ped faces and in pores; moderately alkaline (pH 8.0); clear wavy boundary. (8 to 16 inches thick).

B1tca-18 to 22 inches; very pale brown (10YR 8/3) gravelly sandy clay loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky,

slightly plastic; few fine and very fine roots; many very fine interstitial pores; many thin clay films on ped faces and in pores; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (2 to 6 inches thick).

C1-22 to 29 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky, nonplastic; few fine and very fine roots; many medium to fine interstitial pores; effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (5 to 10 inches thick).

C2-29 to 40 inches plus; very pale brown (10YR 8/3) silt loam, grayish brown to light olive brown (2.5Y 5/3) moist; with many fine and medium pale yellow (2.5Y 7/4) and light olive yellow (2.5Y 5/8) mottles; massive; slightly hard, very friable, slightly sticky, slightly plastic; common fine and very fine roots; many fine and very fine interstitial pores; effervescent, strongly alkaline (pH 8.8). (10 to 20 inches thick).

Type Location: Nye County, Nevada. NW¼ SW¼ Section 26, T. 10 N., R. 46 E. (Monitor Valley north, stop P.)

Range in Characteristics: Coarse fragment content varies within the profile. The surface and B2t horizons usually contain less than 15 percent coarse fragments. The substratum is stratified with some layers being very gravelly; however, the gravel is usually fine in size. The surface has value of 6 or 7 dry and 4 or 5 moist with chromas of 2 or 3. The texture is typically sandy loam, but includes light sandy clay loam and may or may not be gravelly. The subsoil has value of 6 or 7 dry; 4 or 5 moist with chromas of 3 or 4. The lower subsoil may be one value higher due to lime content. The texture is typically sandy clay loam and is usually gravelly in the lower part. The substratum has value of 7 or 8 dry and 4 or 5 moist with chromas of 3 or 4. The substratum is stratified so textures are highly variable; however, strata of fine gravel and coarse sand are usually intermittent with silt loams and sandy loams.

Geographic Setting: The Xerollic Haplargid soils occur on gently to moderately sloping old alluvial fans, in Nye County, Nevada, at elevations of 6,500 to 7,500 feet. Slope gradients range from 0 to 8 percent.

Geographically Associated Soils: The Xerollic Haplargid soils are associated with the soils of the Olson, Ratto, Shipley series, and Haploxerollic Durorthid subgroup. Both the Olson and Ratto soils have duripans at shallow depths. The Haploxerollic Durorthid and Shipley soils lack an argillic horizon.

Drainage and Permeability: Well-drained; permeability is moderate.

Use and Vegetation: Mainly grazing, watershed, wildlife habitat and recreation. Native vegetation consists of big sagebrush, bud sagebrush, low rabbitbrush, squirreltail, and Indian ricegrass.

APPENDIX

B

DISCUSSION AND CRITERIA FOR SOIL COMPACTION

MAP LEGEND
(FOR DETAILED SOIL MAP)

SOIL COMPACTION

Introduction

The ability to compact soils has long been recognized by soil engineers, scientists, and farmers.

Historically, most research regarding soil compaction has been accomplished through two principal interests.

The first interest (how to compact soils) comes from the construction industry. This interest is to avoid soil failures in such engineering structures as earth dams, dikes, levees, building foundations, roads, and the like.

The second interest (how to keep the soils from compacting) comes from the farming industry where problem "plow pans" were developed from tillage operations. Consequent research by farmers, agronomists, and agricultural research institutions addressed the problem of eliminating the "plow pan" after it had formed, and how to avoid reoccurrence.

Recently, a third interest has developed. With the advent of greater numbers of people using public lands for a wide variety of uses, administrators of public lands need good guide lines to avoid problems of soil compaction affecting the natural ecology and future land use. In addition, the administrators of public lands need sound guides for making sound land use decisions. It is to this end that Earth Environmental Consultants, Inc. offer the following discussion and criteria for determining soil compaction hazards for various kinds of traffic.

Discussion

Basically, soil compaction is the increasing of the soil's bulk density (usually expressed as pounds per cubic foot) by applying pressure to the soil. The applied pressure (energy) required to compact the soil is usually expressed as foot pounds per unit area.

The potential of a soil to be compacted is a function of the soil's physical and chemical characteristics, as well as its moisture content. Engineers have designed a classification system that categorizes soils according to their most important physical characteristics. For example, the Unified Engineering Classification System takes into account partical size distribution (that is how much sand, silt and clay are contained in the soil) as well as the soil's liquid and plastic limits (USDA-SCS, 1971). Thus, the Unified soil class should be one criterion for assessing soil compactability.

Engineers have also designed a compaction test called Standard Proctor, to determine, in the laboratory, how much a soil can be compacted with a given amount of compactive effort (foot pounds of applied energy). This test also identifies the optimum moisture content for maximum compaction. Very dry soils and very wet soils are not easily compacted. The "Optimum Moisture Content" for most soils is a moisture content slightly less than the moisture content at the soil's Liquid Limit and slightly more than the moisture content at the Plastic Limit. From the agronomic point of view these moisture contents closely approximate the moisture content at 50 to 75 percent of "field capacity." Field capacity is the maximum amount of moisture a soil can hold with minimum loss to runoff or deep percolation. The amount of time the soil moisture remains near the "Optimum Moisture Content" will be referred to, in this text, as the Critical Moisture Period.

Whether the soils are normally wet, moist or dry, is important as to the Critical Period. Thus the soil drainage classes (USDA-1951) should be one of the criteria for assessing soil compactability.

In addition to the Unified soil class and soil drainage class, the third criteria that should be used for assessing soil compactability is the amount of pressure applied to the soil. As an example, most grazing animals have a weight:hoof ratio so that, when walking, the hooves exert a pressure of an average of 20 to 30 pounds per square inch (psi) on the soil. A rubber-tire vehicle exerts the same amount of pressure as the air pressure inside the tires. For example, a car with air pressure in the tires of 32 psi will exert pressure on the ground of 32 psi. Track-type vehicles exert a pressure on the ground of the weight of vehicle divided by the surface area of tracks on the ground. Since the surface area of tracks is usually large in comparison to vehicle weight, these vehicles usually exert much less pressure on the ground as do rubber-tire vehicles.

To rate soils as to compaction hazard, the table on the following page and subsequent criteria are suggested:

SOIL COMPACTION HAZARD

FOR VARIOUS KINDS OF TRAFFIC (1)

Soil Map Symbols by Soil Groups	Kind of Traffic			
	(2) livestock	(3) light vehicles	(4) heavy vehicles	(5) range plows

(1) Interpretations are for when soil moisture conditions are near the Optimum Moisture Content (50 to 75 percent field capacity) only.

(2) Only applicable where livestock congregate in numbers. For example, in corrals, holding pens, or near watering or feeding facilities. Rate Hazard as slight (SLI), moderate (MOD), or severe (SEV) according to Guide using depth criteria I.

(3) Light vehicles are any tracked vehicle or any rubber tired vehicle with normal tire air pressure of less than 30 psi Rate Hazard as slight (SLI), moderate (MOD) or Severe (SEV) according to Guide on the follwing page, using depth criteria I.

(4) Heavy vehicles are any vehicle exerting a load on the ground surface of greater than 30 psi (tire pressures of greater than 30 psi for rubber tired vehicles) Rate Hazard as slight (SLI), moderate (MOD) or severe (SEV) according to Guide using said depth criteria II.

(5) Range Plows - Mold-board or disk. Interpretation assumes a plow depth of 4 to 10 inches. For other depths consider unified engineering class at specific depth.
Rate Hazard as slight (SLI), moderate (MOD) or severe (SEV) according to Guide using soil depth criteria III.

GUIDE

FACTOR	SLIGHT	MODERATE	SEVERE
Average Unified Soil Class Criteria I (0 to 4") Criteria II (0 to 7") Criteria III (0 to 10")	GW,GP,GM,SW, SP,OL,OH	GC,SM,SC,ML, CL	MH,CH
Soil Drainage Class	Somewhat excessively drained, Excessively Drained	Moderately well-drained, Well-drained	Very poorly drained, Poorly drained, Somewhat poorly drained
Critical Period (after soil saturation	<24 hrs	1 to 5 days	> 5 days

Notes:

1. Use "Guide for Interpreting Engineering Uses of Soils" USDA-SCS, 1971 for determining Unified soil class.

2. Use "Soil Survey Manual," Handbood 18 USDA-SCS, 1951 for determining soil drainage class.

3. Critical period means "that length of time soil moisture remains at or near the Optimum Moisture Content for compaction." See discussion section in this Appendix.

4. Even though the criteria used for these interpretations are well established and have been tested in diverse areas, these specific interpretations have not been field tested and may require some adjustments after they have been field tested.

MAP LEGEND

(For Detailed Soil Maps)

Mapping unit delineation and soil map symbol — 3834 a

Approximate section corners — 9 — 5

Match lines and adjoining photo number (Green line) — 3-102

Reservoir, lake or pond — WATER

Survey area boundary (Heavy black line)

Soil pit location — Ⓚ

Township and range numbers — T 5 N / T 4 N — R 8 E | R 9 E

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Soil Inventory of Tonopah Range ES Area

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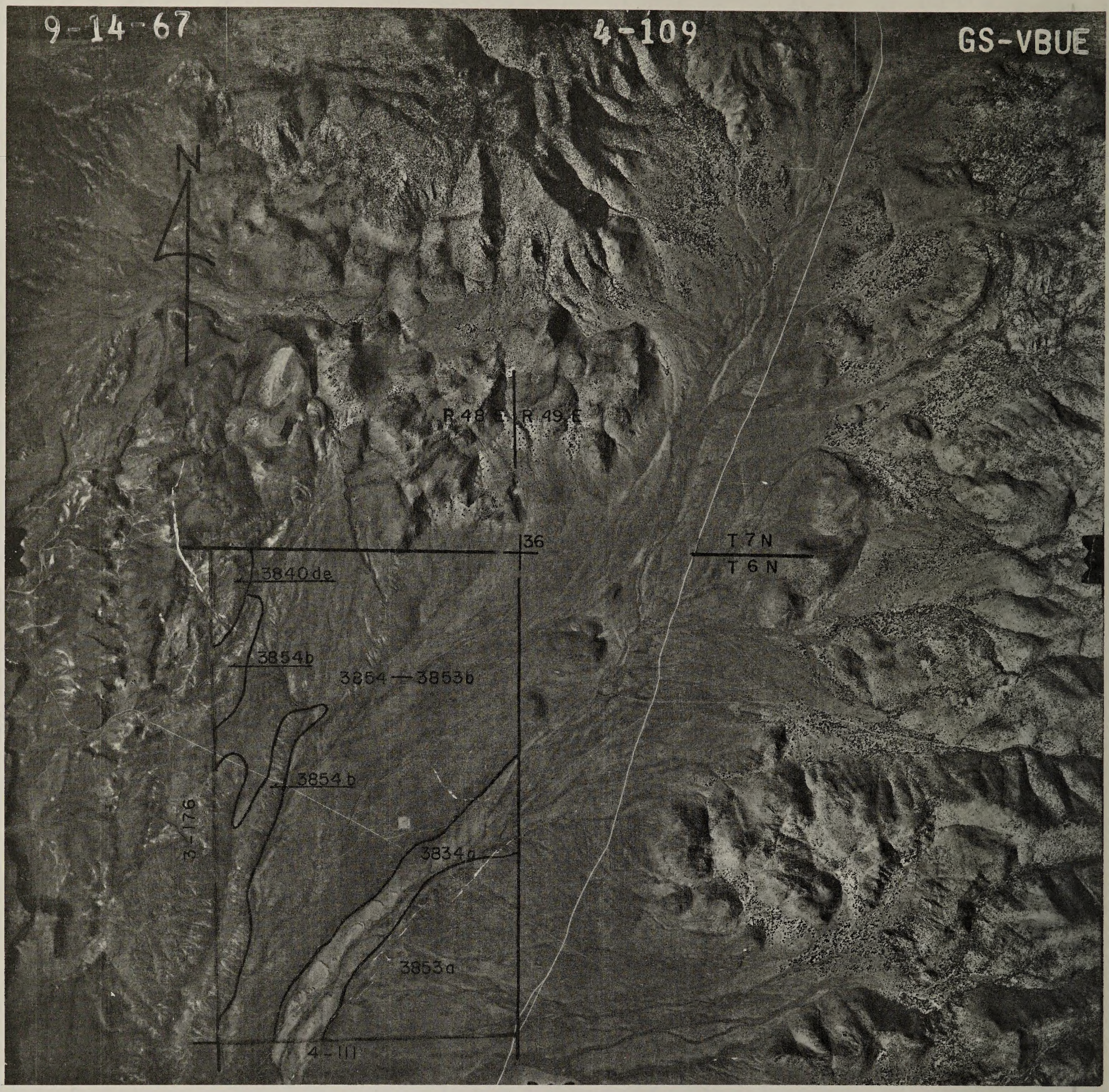

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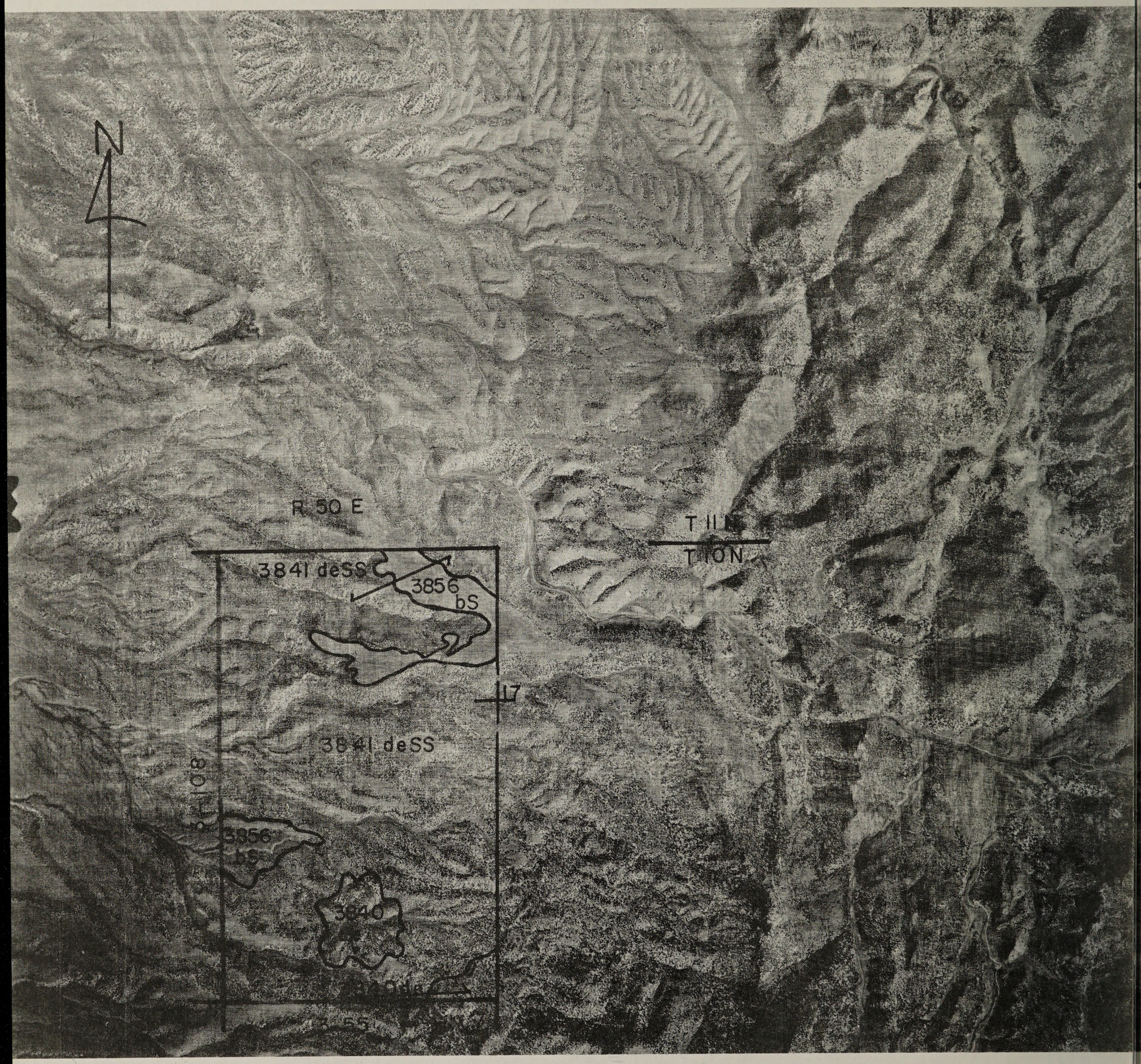

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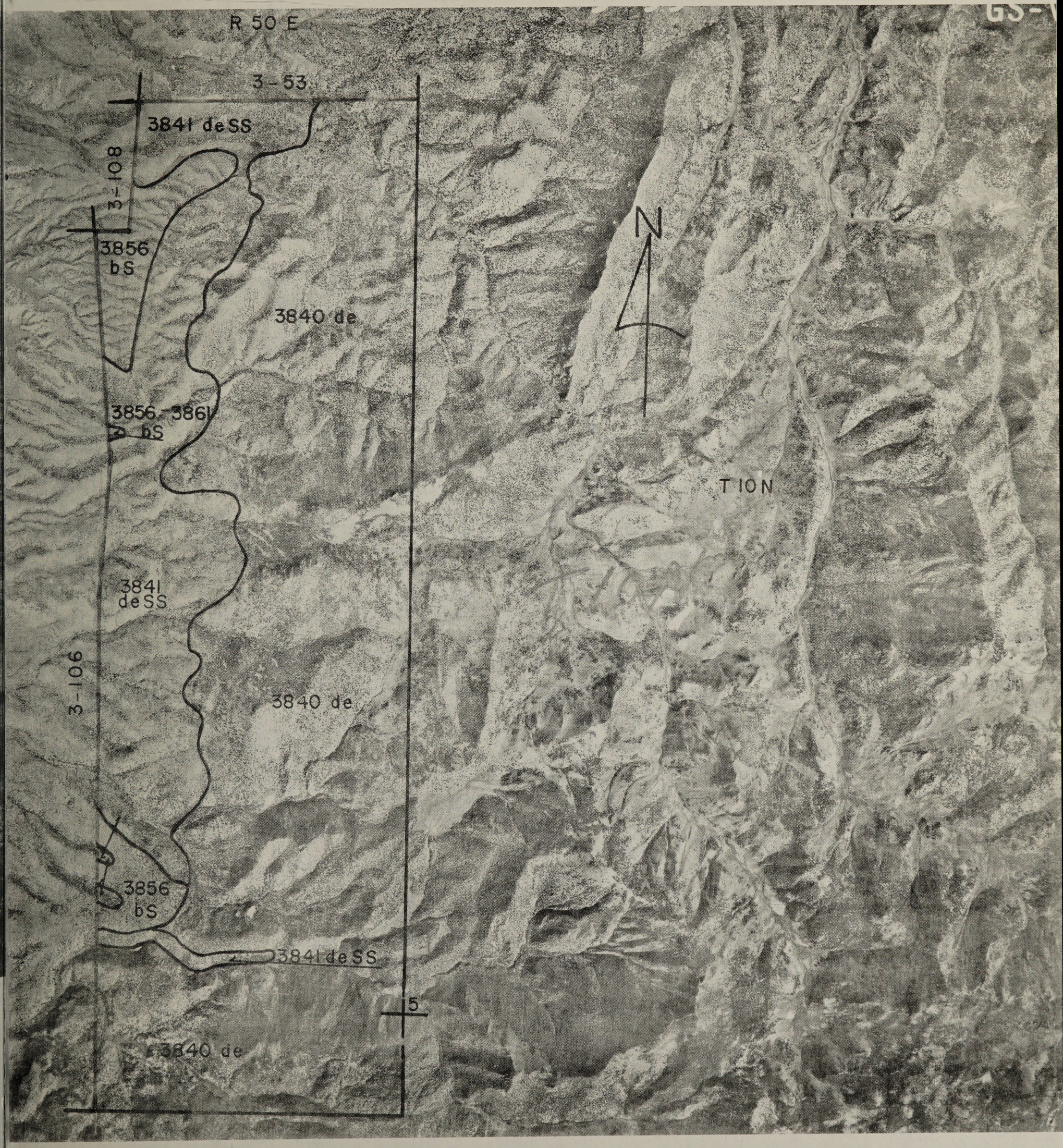

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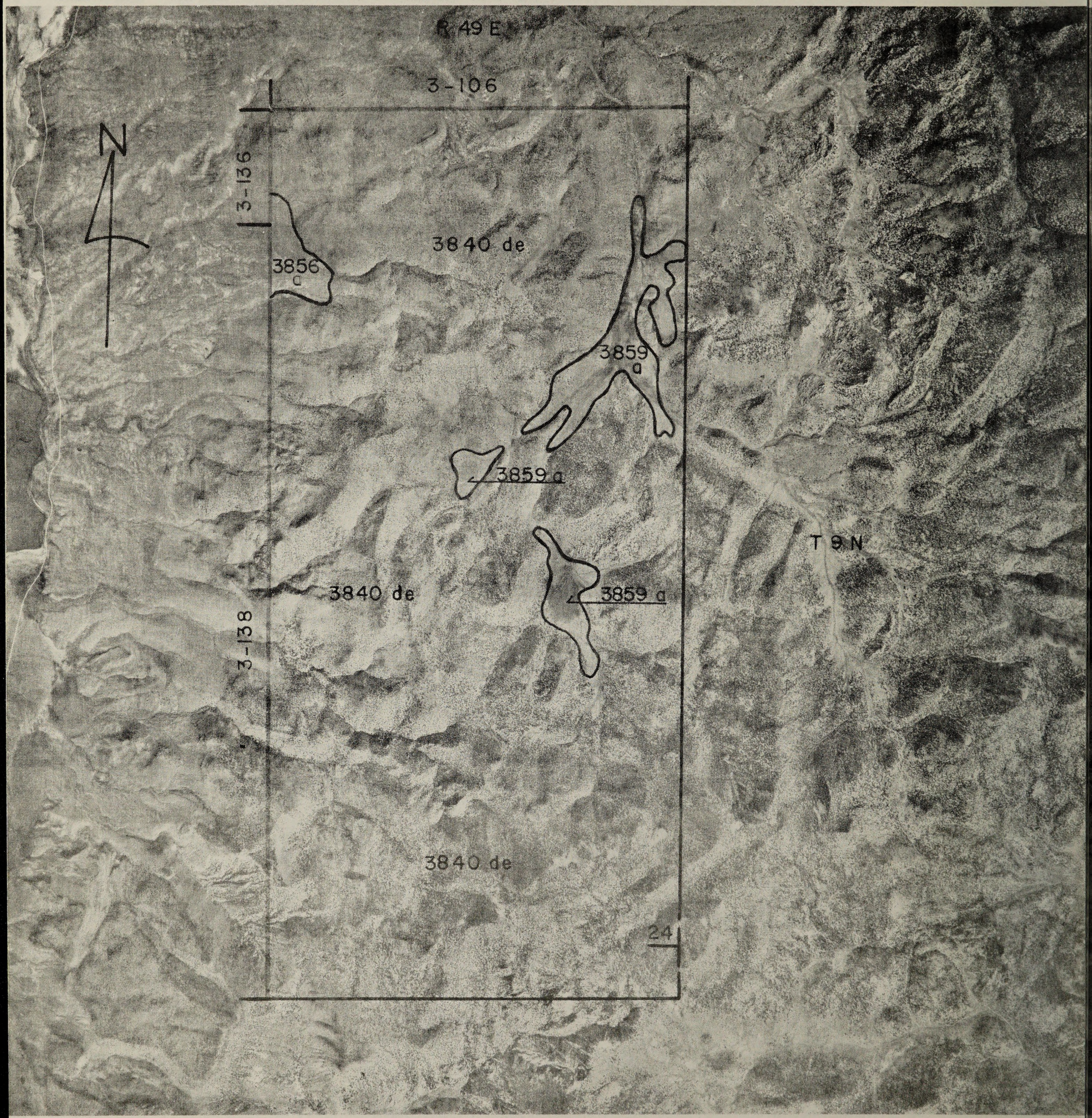

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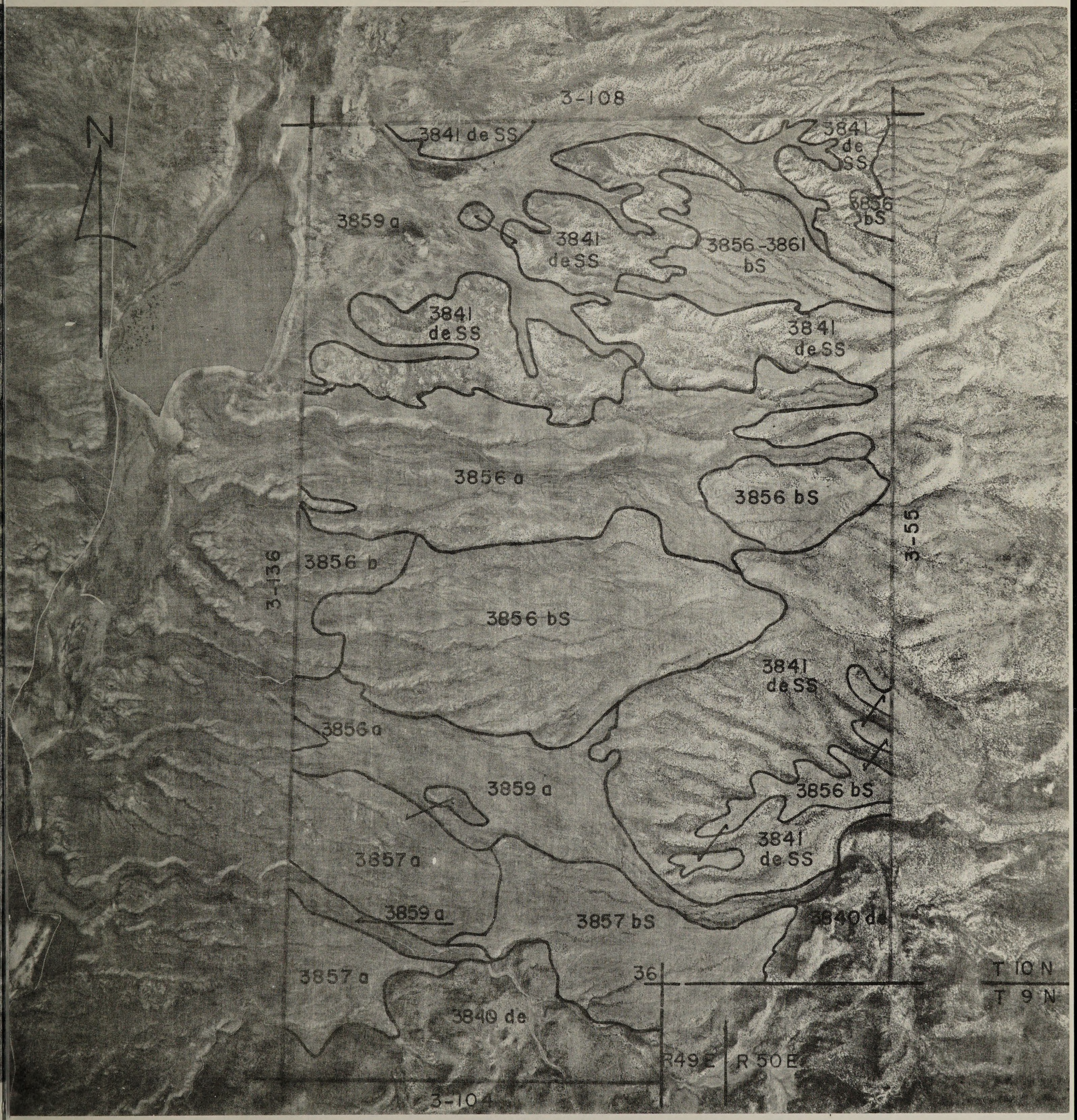

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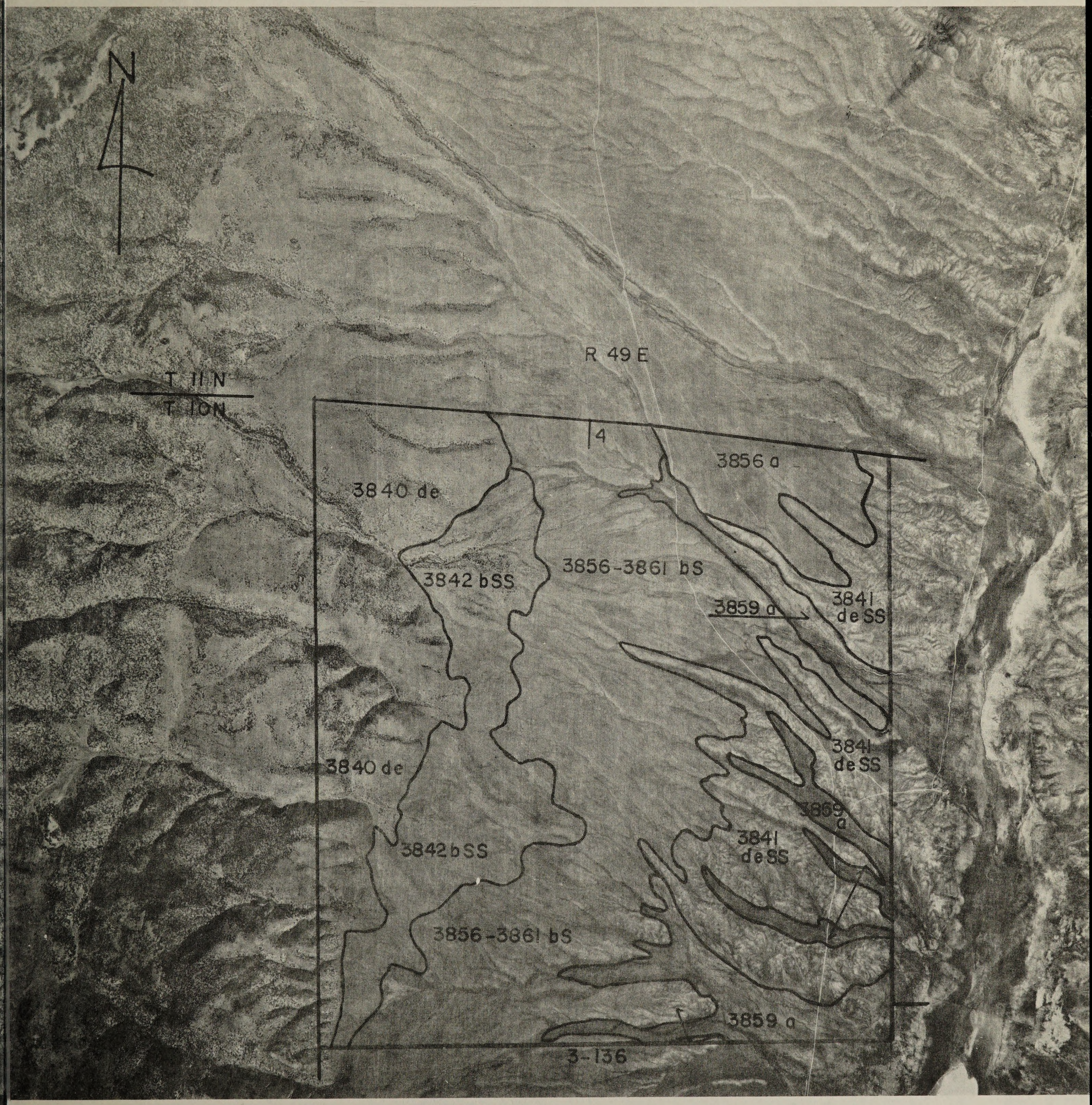

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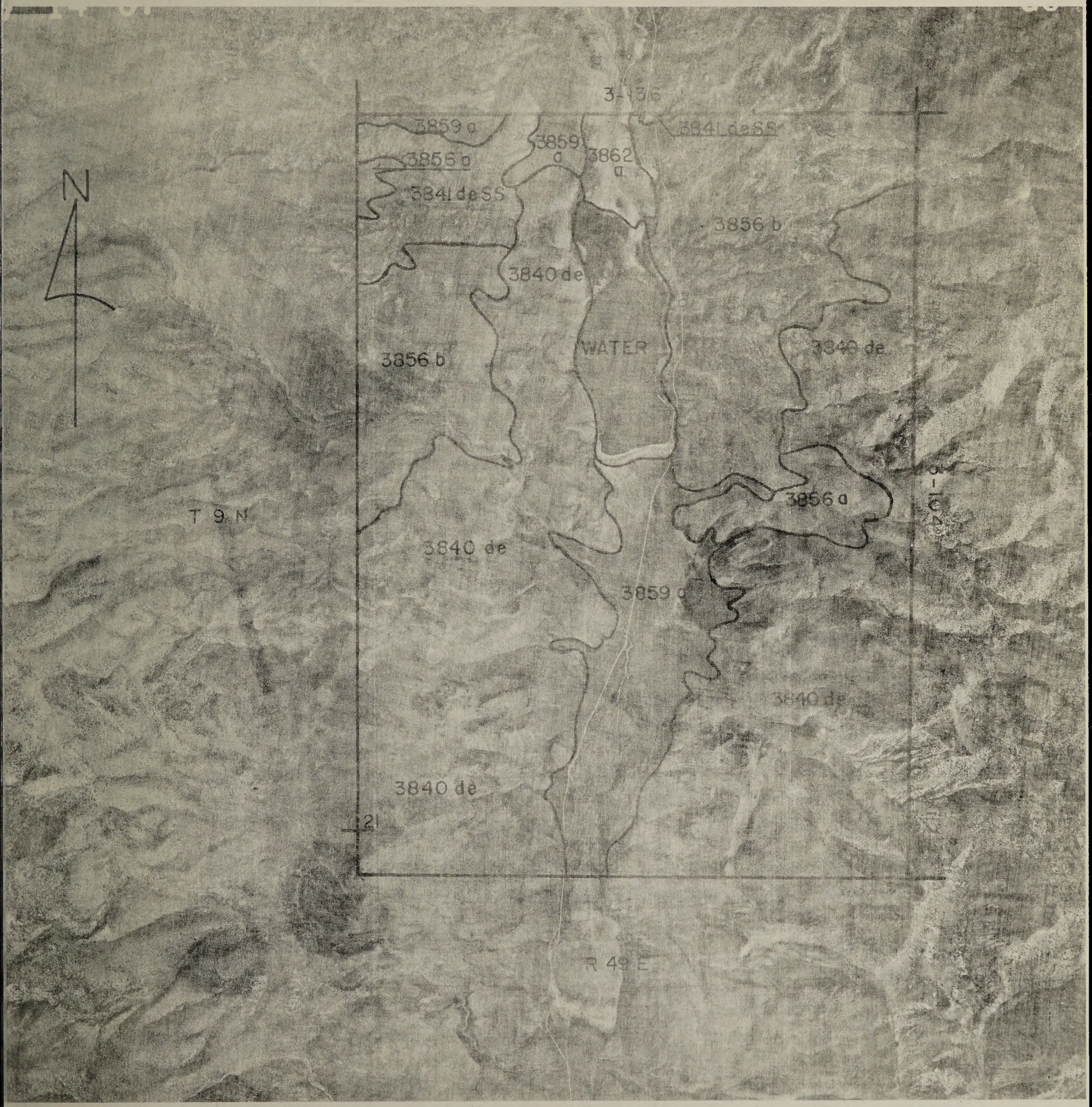

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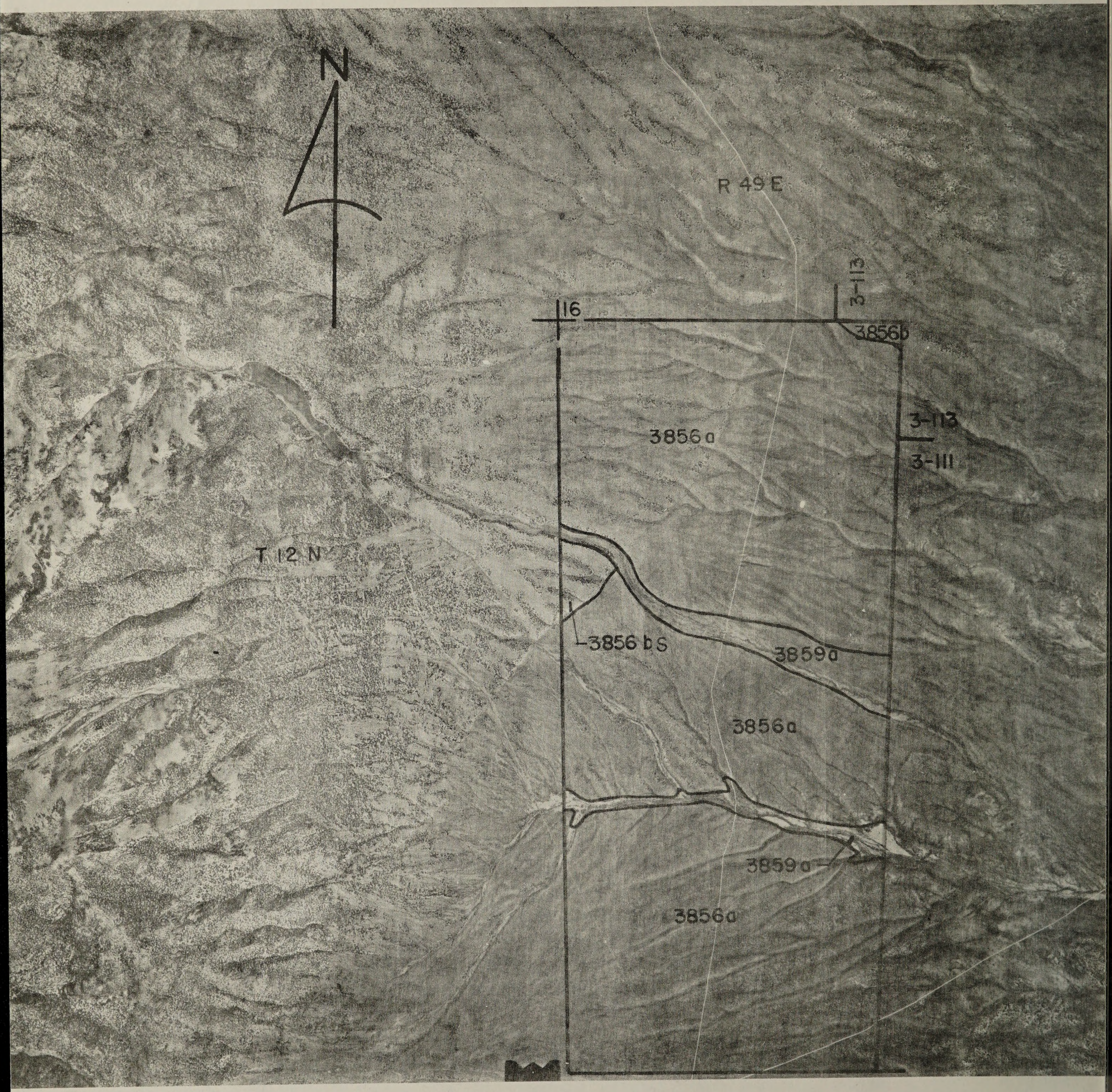

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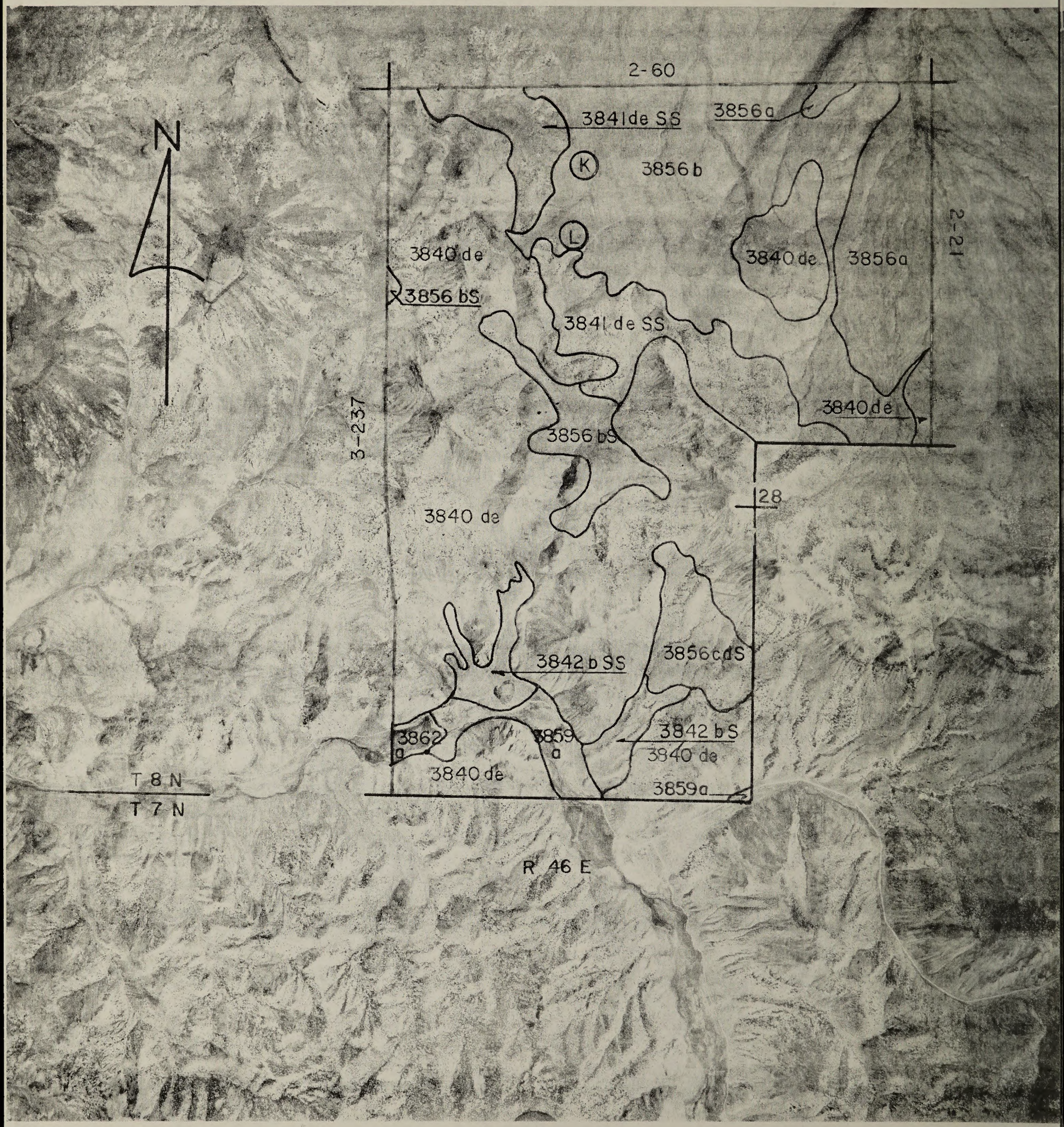

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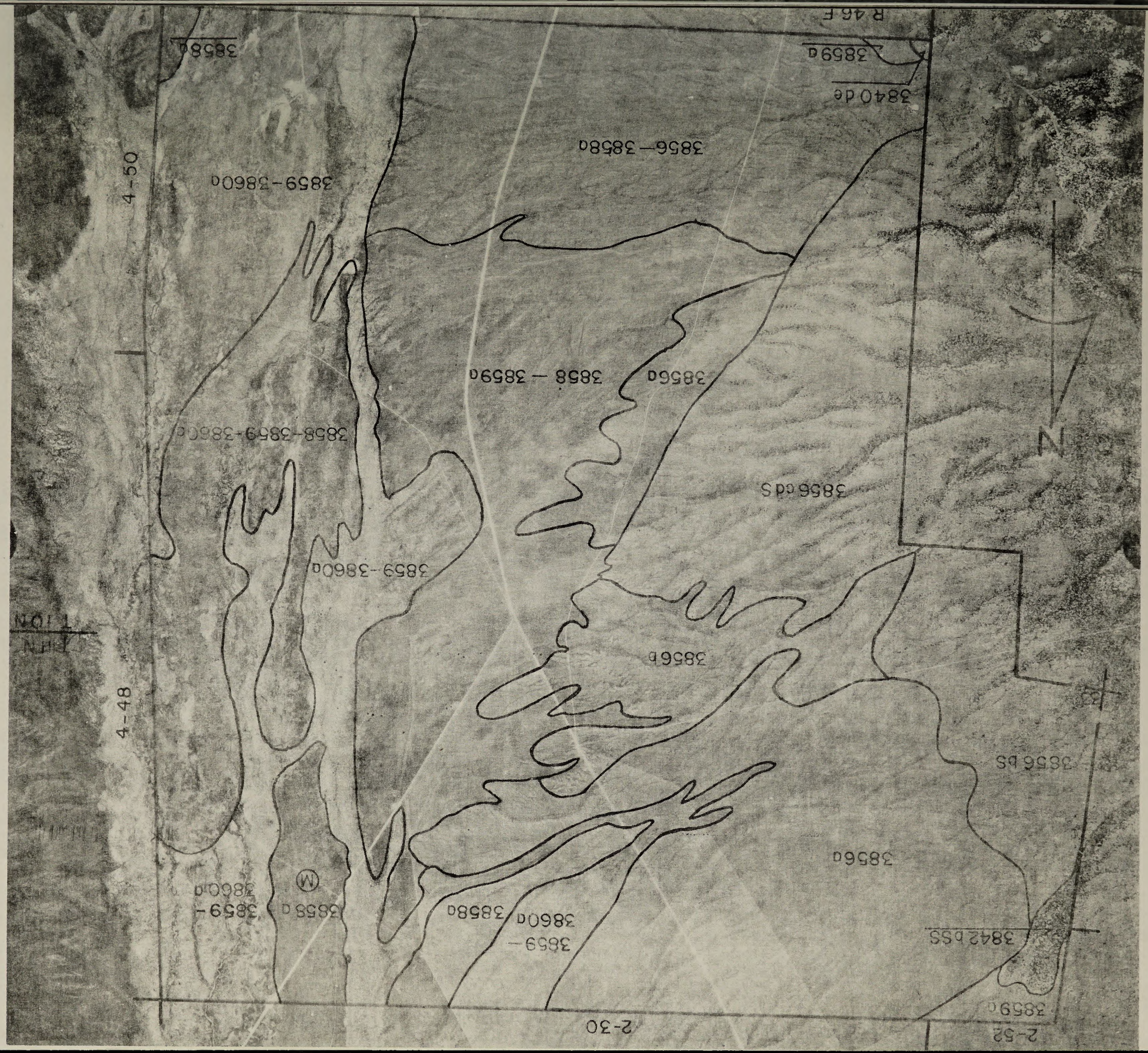

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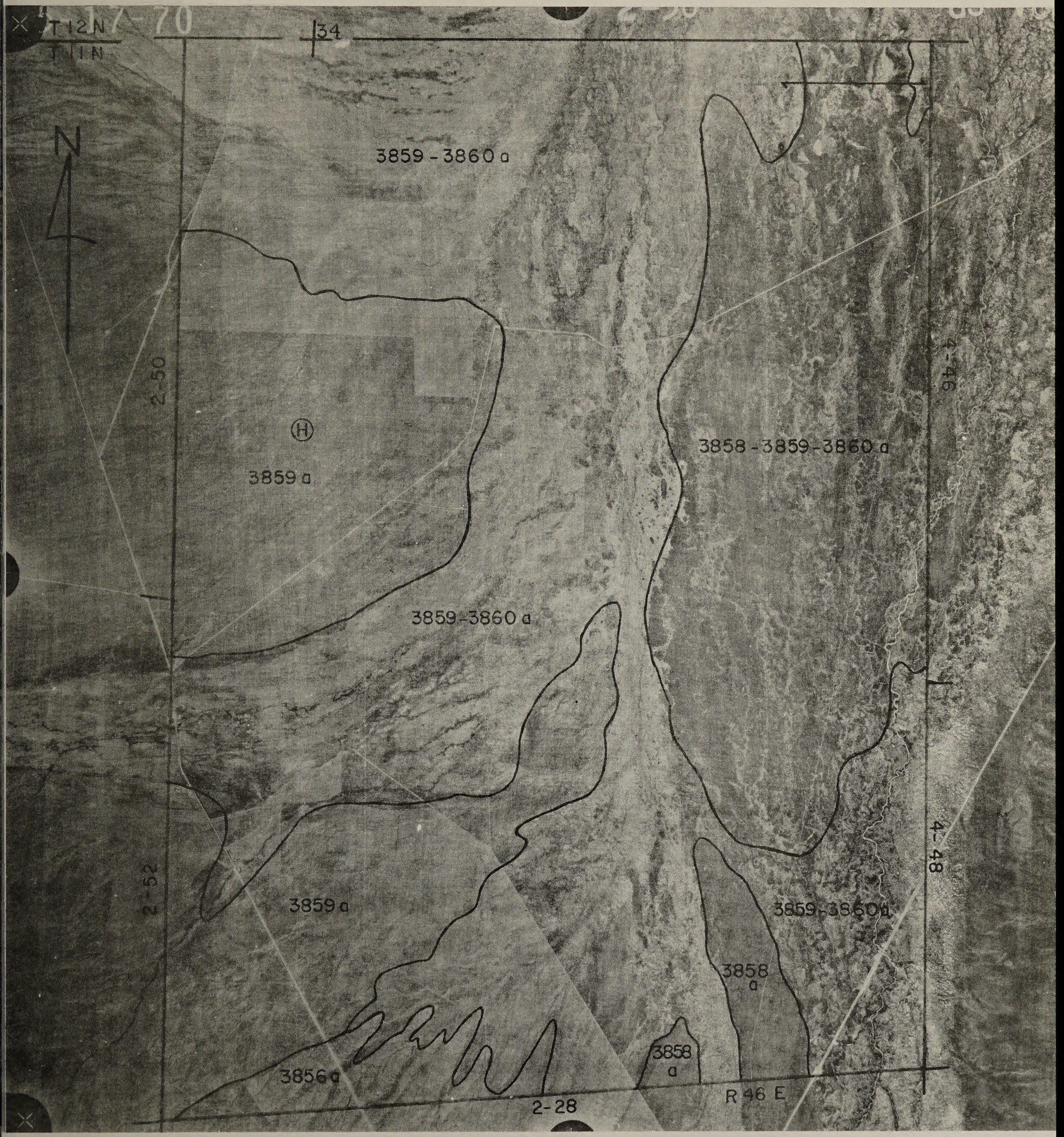

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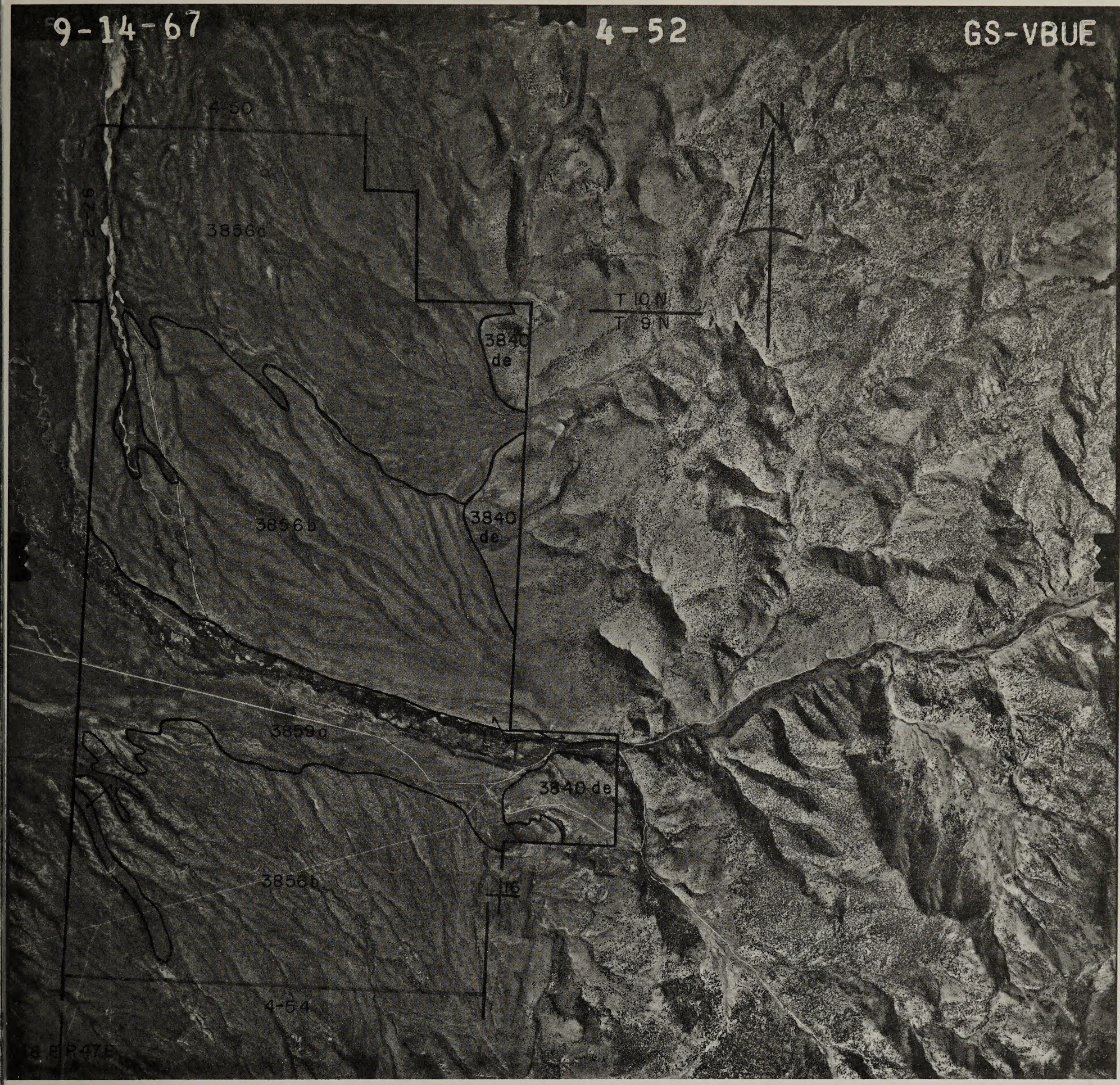

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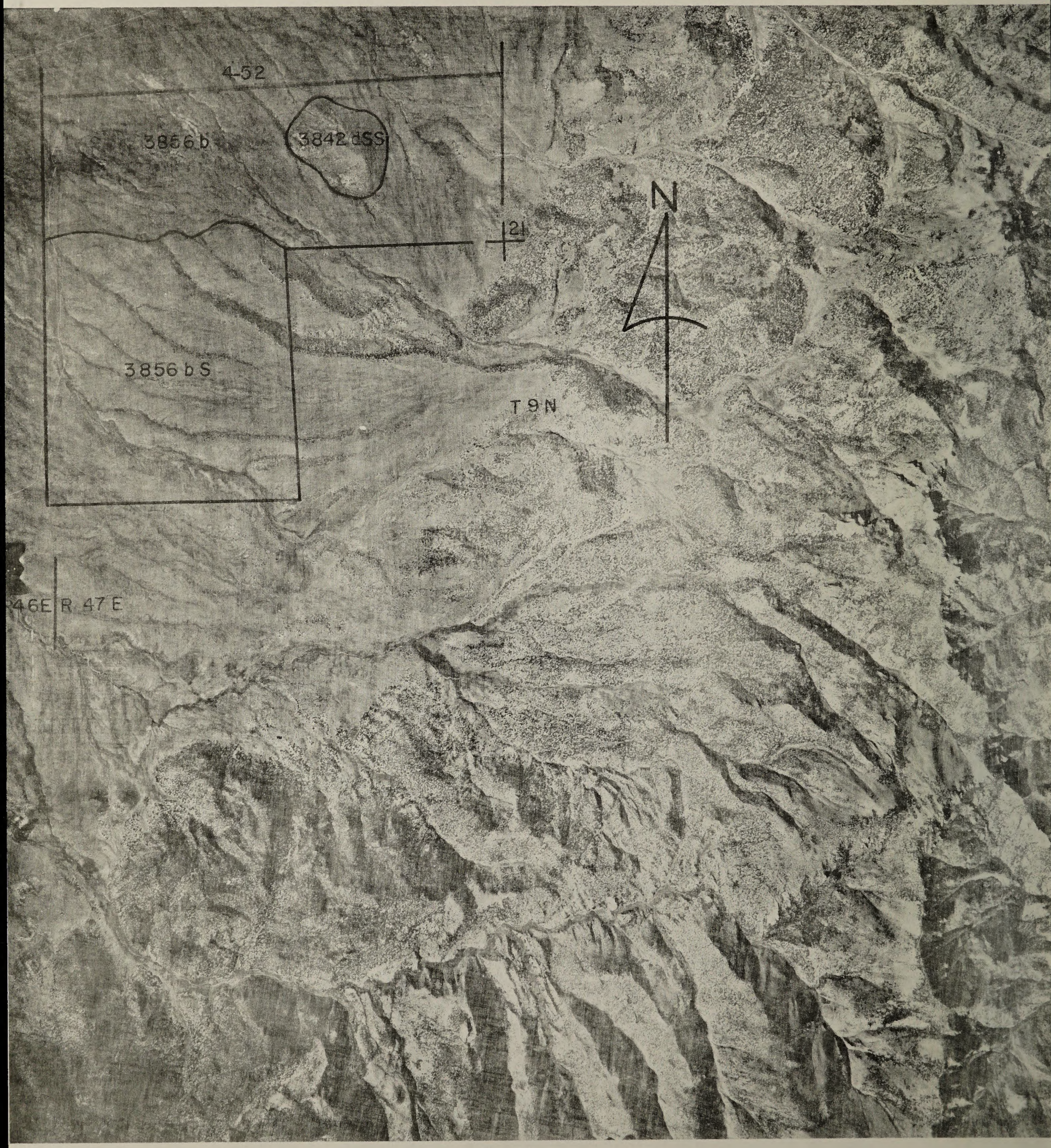

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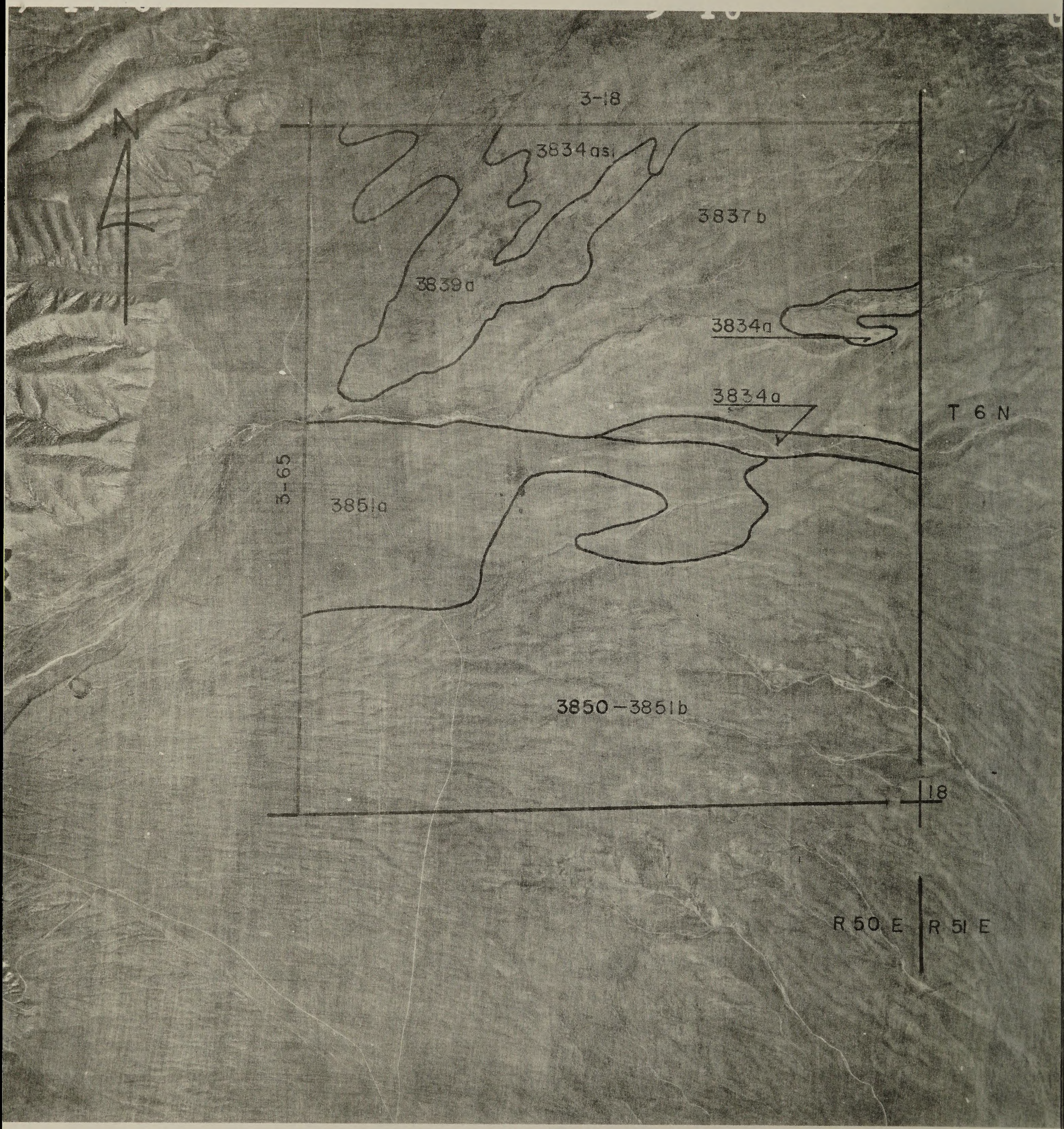

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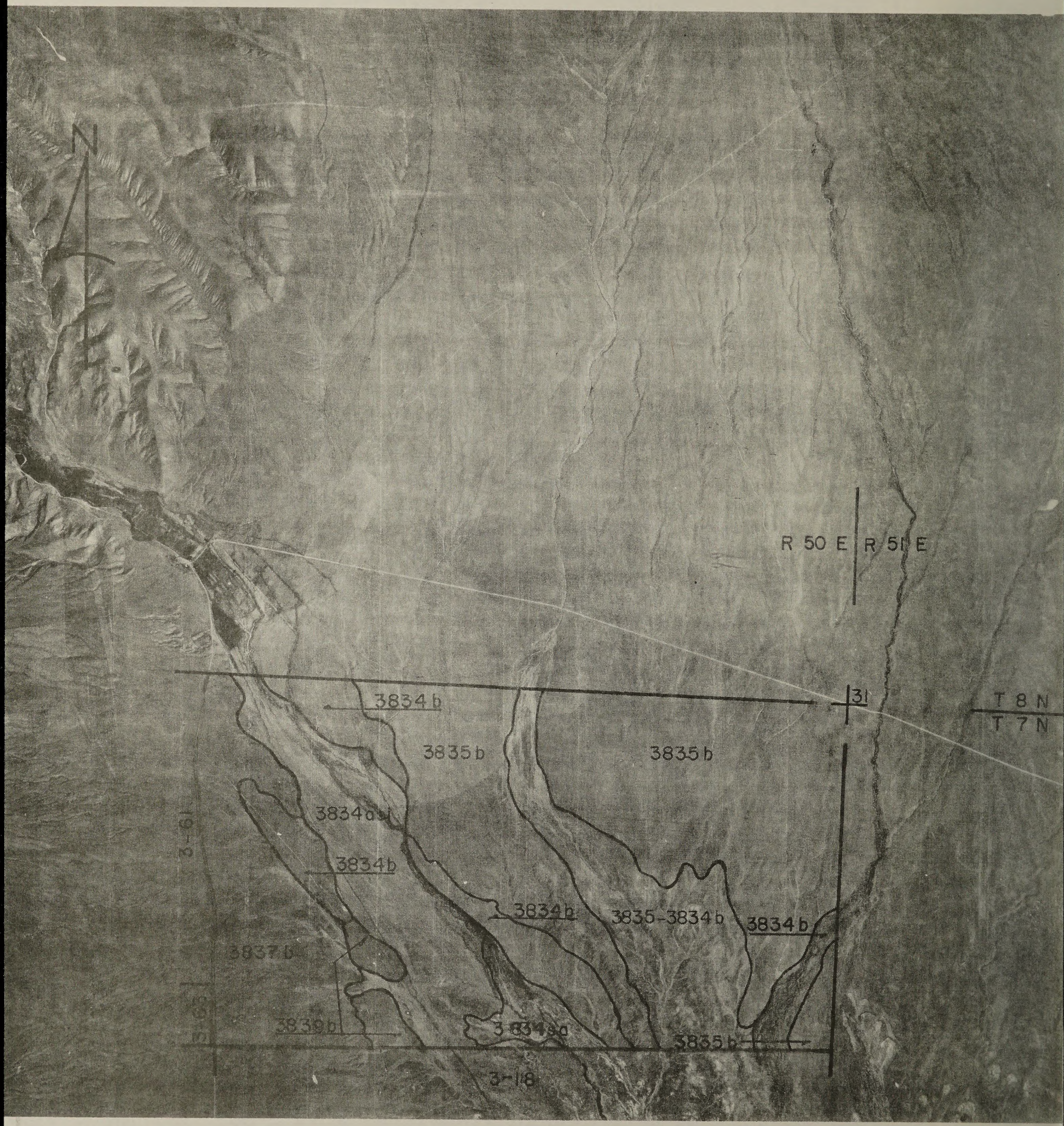

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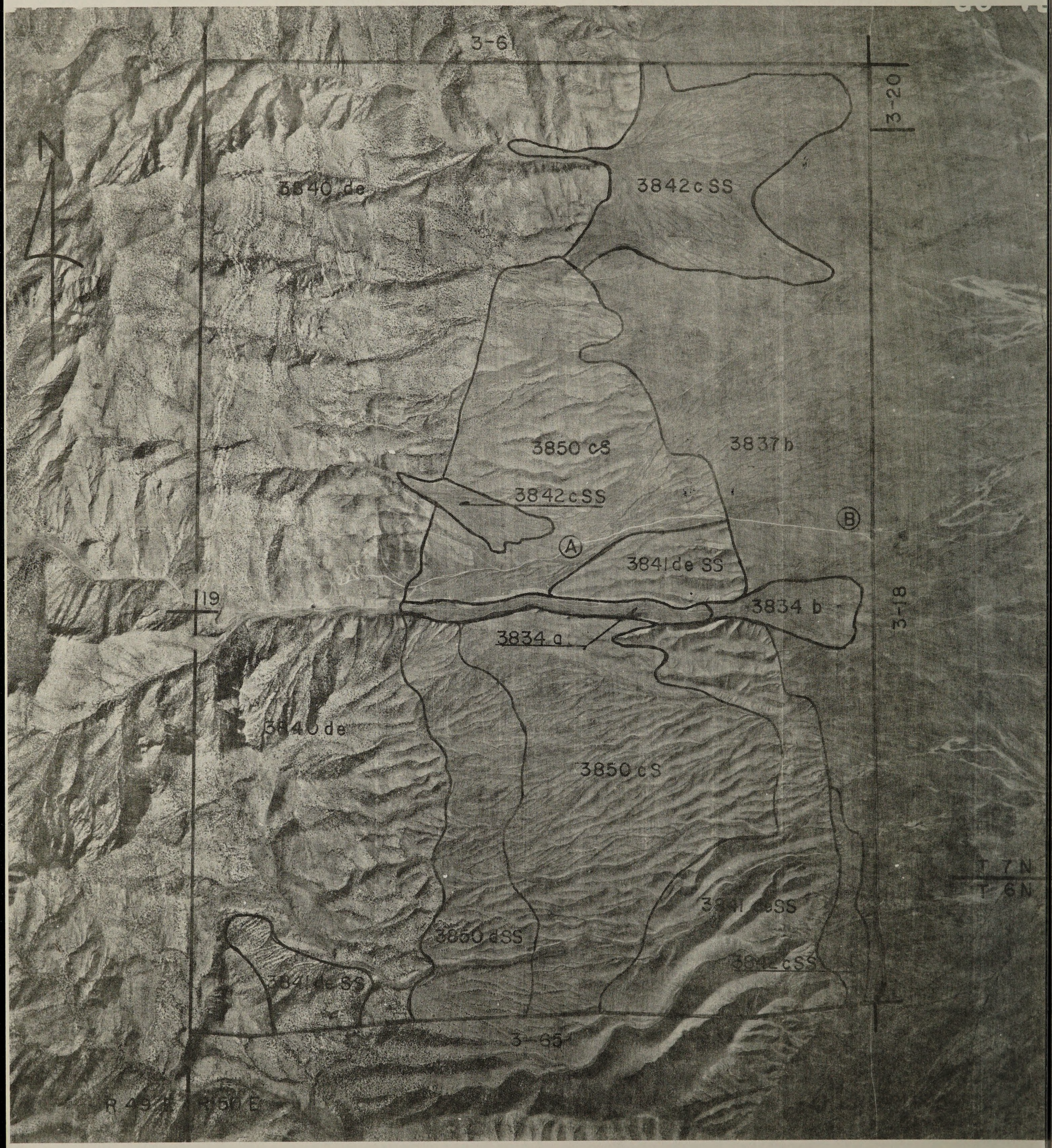

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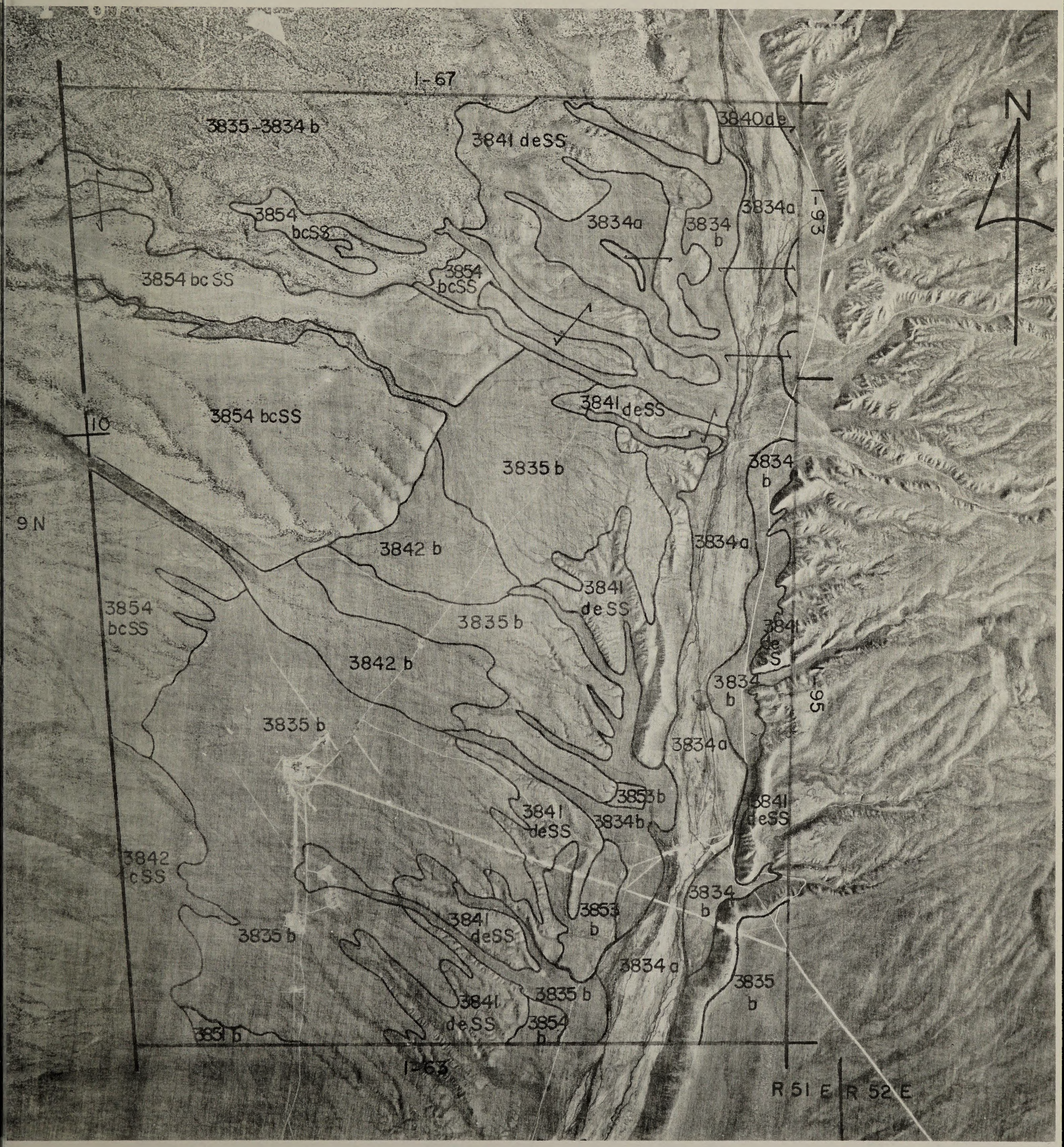

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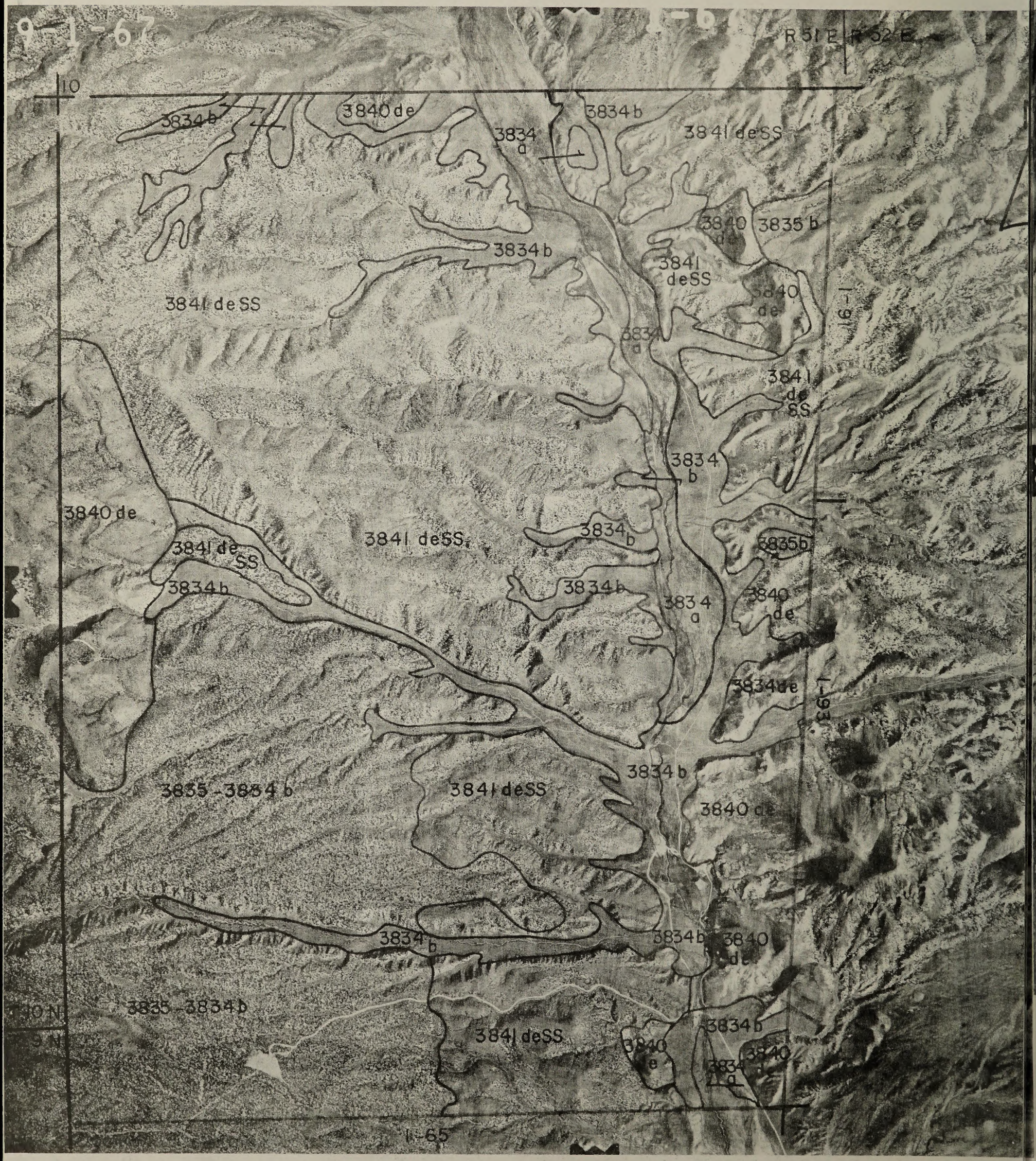

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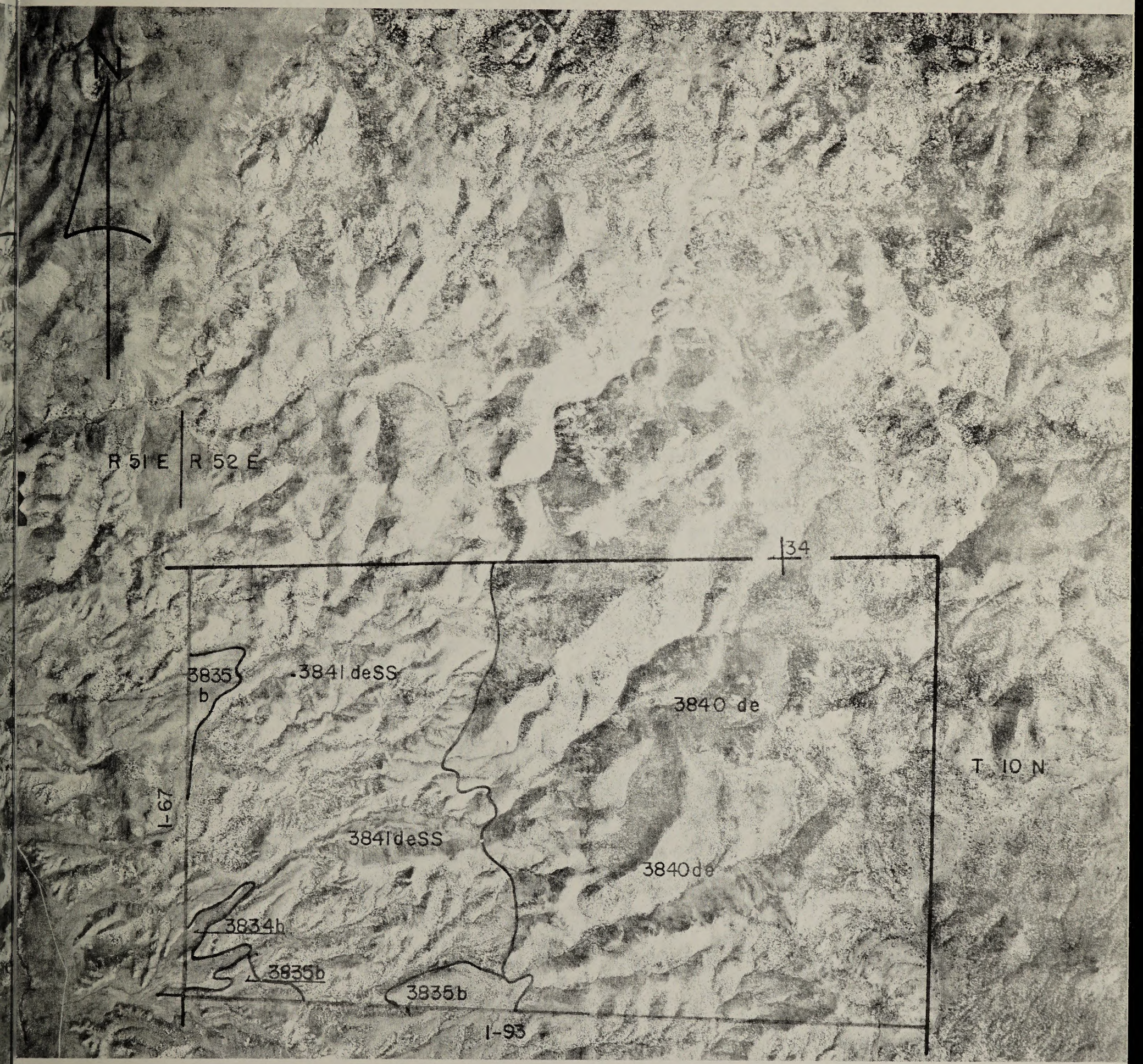

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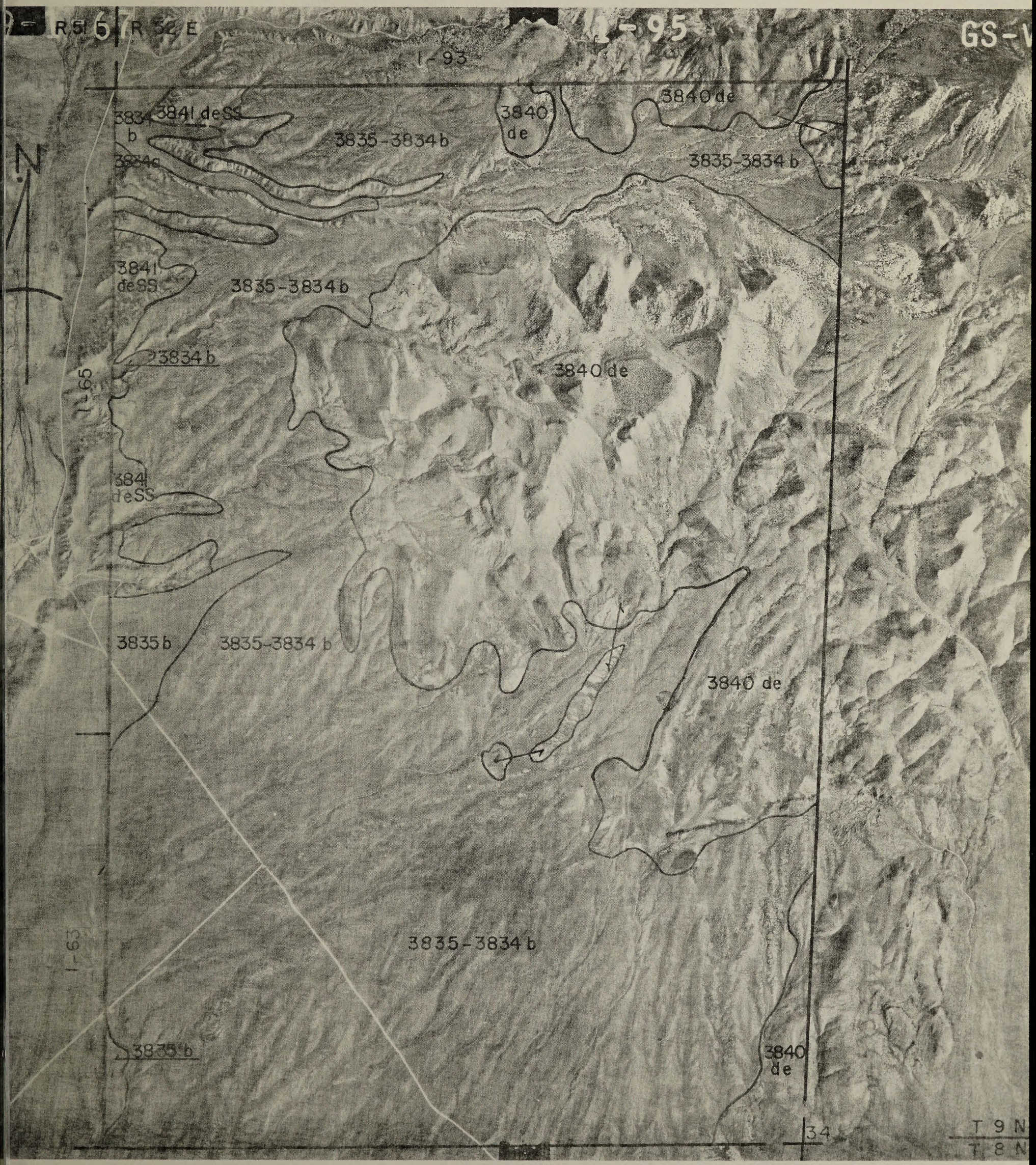

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